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AFRPL-TR-67-238

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AFRPL RAPID INDEXING SYSTEM

Alfred A. Beltran
Lockheed-California Company
Burbank, California 91503

TECHNICAL REPORT AFRPL-TR-67-238

July 1967

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Air Force Rocket Propulsion Laboratory
Air Force Systems Command
United States Air Force
Edwards, California

NOTICES

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Air Force Rocket Propulsion Laboratory
Air Force Systems Command
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FOREWORD

This report was prepared by the Technical Information Department of the Lockheed-California Company, Burbank, California 91503 under USAF Contract AF 04(611)-11749. Within the contractor's facilities, the report is identified as LR 19969.

The work was performed both at the Air Force Rocket Propulsion Laboratory and in Lockheed's Technical Information Department. Overall direction of the program was provided by Mr. D. E. Kistler, the Air Force Project Officer. Project Manager at the Lockheed-California Company was Dr. H. Jacobs, Manager of the Technical Information Department. Alfred A. Beltran, the project leader, was assisted by Robert R. Scranton in planning and administrative matters, with Robert C. Anthony in charge of on-site indexing. Systems analysis and computer programming were under the direction of Mr. W. B. Thompson, assisted by Mr. A. D. Sobol, of Lockheed's EDP Development Planning Department.

This technical report has been reviewed and is approved.

Dale E. Kistler, RPPR
Project Officer

ABSTRACT

A modified Keyword Out of Context (KWOC) system was developed to gain rapid control over more than 8,000 scattered, unindexed documents. This was the first step in providing the technical information support required by Air Force Rocket Propulsion Laboratory scientists and engineers. Implementation of the KWOC system, computer routines, and progress made during the course of the contract are described. Results are evaluated and recommendations for a total technical information program are presented. Complete, detailed procedures for operating the system are provided in the appendix. This includes an extensive, cross-referenced thesaurus.

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INTRODUCTION

In a 1965 study, conducted by the Lockheed-California Company under Air Force Contract AF 04(611)-10915, it was demonstrated that Air Force Rocket Propulsion Laboratory (AFRPL) personnel had a need for an effective information retrieval service. Contract AF 04(611)-11749 was awarded the Lockheed-California Company in June of 1966, to meet the most pressing information requirements of AFRPL personnel as quickly as possible.

Specifically, the Lockheed-California Company undertook development of a rapid indexing system, associated computer programs, indexing procedures, and the indexing of approximately 8,000 technical documents.

A title-based keyword index, supported by corporate author, contract number, and citation indexes, was selected for the basic system. While not the most advanced method for storage and retrieval of information, it was most suited to satisfying immediate needs and it provided a firm base upon which to develop a more sophisticated system.

This report describes the conversion to automation, the automated system and computer routines, and progress made during the course of the contract. Finally, the system is evaluated and recommendations for future work are presented.

1. AFRPL INFORMATION FACILITY SURVEY

A study of AFRPL information facilities and a survey of AFRPL personnel technical information requirements were completed in August 1965. The information facility study revealed that approximately 8,000 unindexed document titles were scattered throughout the various AFRPL offices. The actual number of documents, counting duplicate copies, was estimated at about 30% higher than individual document titles. Incoming documents numbered about 4600 annually, including duplicate copies. Of these, some 3325 were distributed directly to the individuals concerned. No library record was kept of the 3325 documents. The remaining 1275 documents were received directly by the Air Force Flight Test Center (AFFTC) Technical Library and issued to AFRPL personnel on a permanent retention basis.

Survey results of AFRPL personnel technical information requirements indicated:

- There was a pressing need for central document storage associated with an indexing system capable of quickly gaining control over the many scattered, unindexed documents.

- Documents should be on hand and easily retrievable when needed. This requires an active selection, acquisition, indexing, and circulation program.

- Scientific personnel required a Selective Dissemination of Information (SDI) system as an aid in keeping abreast of the rapidly advancing propulsion technology.

- Complete literature search service was desired in support of problems encountered in the course of research.

- Abstracts would be helpful in an automated indexing system printout to overcome the ambiguity of titles.

A need and desire for an on-base information retrieval course was expressed by AFRPL personnel in subsequent conversations, too late for inclusion in the survey report.

2. RAPID INDEXING SYSTEM

A Key Word Out of Context (KWOC) system had been developed at the Lockheed-California Company (CALAC) and programmed for the IBM 7080. The system was used to gain quick control over CALAC's internal documents as the first phase of the Company's overall information center automation project.

CALAC's KWOC system was modified to meet AFRPL's format and printout requirements and the computer program was converted for use on their IBM 7040. Detailed documentation was provided for program maintenance, and step by step instructions were written for keypunching and computer operations.

The AFRPL Data Processing Programmer was put through a familiarization period with the program logic. Program modifications, as required in the continuing effort, were then made by the Programmer in consultation with CALAC Data Processing Planning, personnel.

Indexing Procedures, including a Corporate Author Authority List, were completed in preliminary form prior to the start of on-site indexing. Indexing routines, forms, and flow of work were developed. A system was developed for gradual recall of the unindexed documents scattered throughout the AFRPL facility. Office space and equipment were provided and the Rapid Indexing project became operative.

3. FUTURE PLANS

The Rapid Indexing System is very flexible. While meeting immediate AFRPL documentation requirements, the system also provides a firm base upon which to develop an advanced, more sophisticated information system. Future plans include both increased information services and use of improved equipment.

Controlled vocabulary indexing has been made feasible by the printout of keywords generated in the KWOC system. This printout, when corss-referenced, becomes the basic thesaurus for future indexing. Once a controlled vocabulary is used, a more advanced information system can be developed. Such a system can index more specifically and with greater consistency, eliminate word suppression, combine descriptors to serve in lieu of an abstract, and provide selective dissemination of information.

Several advances in automated equipment are worth consideration in future plans. Optical scanning equipment has been developed recently that permits direct recording of data from source documents on to magnetic tape. Audio, rather than visual response, is now practical. Extensive use of microfiche has become attractive due to standarization of the microfiche and improved readers and reader-printers.

Advantages, capabilities, and applications of the more sophisticated systems and advanced equipment to AFRPL's information system are explored in detail in SECTIONS VI and VII.

SECTION II

CONVERSION TO AUTOMATION

1. CHRONOLOGY

The period from July 7 through July 20, 1966, was devoted to setting up and equipping the Lockheed Indexing Facility at the Air Force Rocket Propulsion Laboratory. Arrangements were made for delivery of the first 43 cartons of reports for indexing. Upon arrival, these documents were sorted by corporate author; duplicate copies were removed and prepared for destruction.

An indexing test run was started on July 20, and the first trail keypunch input sheets were typed on July 21. On the basis of test results, typing rules were established and a method for indicating chemical subscripts and mathematical superscripts was devised.

During the period from July 25 through July 28, procedures were developed for submitting corrections tokeypunched entires. Final rules for establishing corporate author entries were formulated. The KWOC object program conversion was completed, the AFRPL Data Processing Programmer was instructed in operation of the system, and the sample computer run based on 55 documents was completed.

Computer documentation was submitted to the Air Force in August. Included in the documentation were:

- narrative description of the KWOC indexing computer system
- program logic
- record formats
- compilation source deck lists for all programs
- a test case
- job run procedures
- punched card decks for operation and maintenance of the system.

The first 935 documents were indexed and a printout, covering 585 of these documents, was obtained.

Systems for flow of reports into and out of the Lockheed Indexing Facility and for designating document location became operative in September.

A revised edition of "Procedures for the AFRPL Rapid Indexing System" was issued in December. This revised edition completely replaced preliminary procedures.

The first cumulative printout, covering 1591 documents, was issued on January 27, 1967. On February 8, the first shipment of documents was received from the Air Force Flight Test Center (AFFTC) Technical Library.

On March 24, the second cumulation, covering documents 1 through 2792, was issued. The remodeled AFRPL Library and new vault officially opened on March 31, 1967.

The third cumulated index, covering documents 1 through 4500, was distributed on May 12, A total of 8280 documents was indexed between July 20, 1966 and May 31, 1967.

At close of the initial contract, on June 27, 1967, a cumulation of documents 1 through 8280 was completed. This final cumulation provided the list of keywords and suppressed terms necessary for producing the thesaurus. An additional 558 documents were indexed for keypunching and printout at a later date.

2. BACKGROUND

The Rocket Propulsion Laboratory is the organization assigned the responsibility for Air Force rocket propulsion research and development in the amount of approximately $42 million a year (FY 67). To this end, AFRPL personnel monitor about 225 contracts, are engaged in over 30 in-house projects, and evaluate over 125 unsolicited proposals annually. They also prepare an average of 125 major purphase requests, each of which yields from 5 to 15 detailed technical proposals which must be evaluated.

AFRPL scientists and engineers must be constantly aware of the latest development in the fields of propulsion, materials, and instrumentation, advanced techniques and materials under study, and successes achieved elsewhere. Without this current state-of-the-art awareness they cannot properly carry out their in-house projects, prepare purchase requests, evaluate proposals, and monitor contract results. Rapid retrieval of the report literature is one of the essentials for affective performance of the Laboratory's assigned tasks.

In pursuit of these R & D activities, AFRPL receives over 4600 documents (including duplicates) per year. Of these, only the AFRPL Memorandum Reports and Technical Reports, numbering over 500 annually, are under excellent control. They have been well indexed by the AFRPL STINFO office since 1958, and the cumulative index receives wide annual distribution.

Another segment of reports, averaging over 1200 a year, are ordered by AFRPL personnel for permanent retention through the AFFTC Technical Library. Until the spring of 1967, when a large classified vault was constructed, the AFRPL Technical Library was not equipped to handle classified documents. Consequently AFRPL scientists and engineers relied primarily on their own individual technical document holdings with a relatively small reliance on AFFTC main base library classified holdings.

Reports produced under AFRPL contract are received directly by contract monitors. Each individual keeps documents related to the contracts for which he is responsible. Others obtain required reports through personal contact with contractors. Reports distributed by the Chemical Propulsion Information Agency (CPIA), about 250 per month, are distributed to individuals by areas of interest.

At AFRPL, these reports have not been centrally indexed or stored. Most individuals maintain unindexed, personal files. Others discard monthly reports and file quarterly and final reports by contract number. Some units keep their reports in scattered filing cabinets without any special filing order or indexing system. Several units have centralized their filing cabinets and maintain simple-to-complex filing and indexing systems. One unit, with over 3000 unindexed reports, has a serious retrieval problem. Another unit receives no reports and is unable to utilize reports scattered throughout other offices and buildings.

In the light of such diverse methods of acquiring, storing, and retrieving documents, conversion to automation could only be effected by establishing a unified indexing system.

It was decided at the outset that, with the availability of documents afforded through a centralized system, duplicate copies of documents could be discarded without loss of effectiveness. However, two copies of more recent reports are now being retained.

The AFRPL STINFO Office was to assume responsibility for obtaining gradual release of documents for indexing. Both parties cooperated closely in quickly solving problems that might otherwise have caused lengthy delays in launching and implementing the conversion to a computer-based, rapid indexing system and a centralized collection of indexed documents.

3. INDEXING SYSTEM

A Keyword Out of Context (KWOC) system was adopted for indexing the backlog of reports. The system's end-product was to be a computer generated book catalog consisting of several indexes.

a. Indexes

The computer program yields four major printouts or reports. Of these, two are for monitoring purposes, and two are indexes. A third monitoring device is a by product of one of these indexes.

(1) Citation Index

The Citation Index is in retrieval number order and has the same function as a library's shelf list. It consists of the retrieval number, corporate author, document title including enhancement terms,

personal author, contract number, report number, AD number, date, number of pages, number of references, and security classification.

(2) KWOC Report

The DWOC Report yields three additional indexes by treating corporate authors and contract numbers as keywords. It also provides a final error detecting printout, the No Key Error section, discussed under monitoring reports. The KWOC Indexes consist of:

(a) Keyword Index

Similar to a library's subject catalog, the Keyword Index consists of a keyword, followed by all document titles from which the keyword was extracted. Date of report and retrieval number are presented for each title.

(b) Corporate Author Index

The Corporate Author Index has the same function as a library's author catalog. It consists of an abbreviated corporate author designation followed by document titles of reports issued by the corporate author concerned. Date and retrieval number follow each title.

(c) Contract Number Index

This index consists of a contract number followed by document titles of reports generated under the contract. Date and retrieval number follow each document title.

b. Monitoring Reports

Three reports are produced for monitoring the accuracy of the indexes.

Two are separate reports and one is a section of the KWOC Report.

(1) Title Master Report

Prior to the computer run, which will result in the various indexes, the sorted master input is audited for card code and retrieval number errors. These computer detectable errors are printed out on the Title Master Report.

(2) Keyword Frequency List

The Keyword Frequency List is an alphabetical listing of all keywords resulting from permutation of words in document titles. This list

indicates the number of times each keyword occurred and which keywords were truncated because of the 18 character limitation. It guides the indexer in selection of descriptors and suppression of terms.

(3) No Key Error List

This section of the KWOC Report indicates document titles without keywords. These titles would not appear on the Keyword Index without title enhancement.

This program provides all indexes and error reports needed for AFRPL to gain access to the indexed reports and for the programmer and indexer to monitor the program. These computer-produced indexes can be issued and cumulated in any desired frequency or quantity within the duplicating capabilities of the printer.

c. Computer Inputs

Three inputs, resulting from information developed by the indexer, are needed to obtain the desired computer runs.

(1) Bibliographic Information Cards

These cards are keypunched from the bibliographic information on the keypunch input sheets which result directly from the indexing process.

(2) Exclusion Word File

This is a file of keypunch cards produced from the suppressed word list prepared and maintained by the indexer. The final, complete suppressed word list appears in SECTION IV of the appendix.

(3) Controls

A set of controls are initiated by the indexer to obtain the type of computer run he requires. These controls are treated in SECTION III on the basis of computer processing and in the Appendix (SECTION I) in relation to the indexing function.

4. PROCESSES AND COMPUTER REPORTS

This section describes the indexing process, brings out significant problems, and indicates how they were resolved. It describes further the computer reports, editing and correcting methods and their application.

Flow of documents through the indexing process is shown in Figure 1, and consists of the following steps:

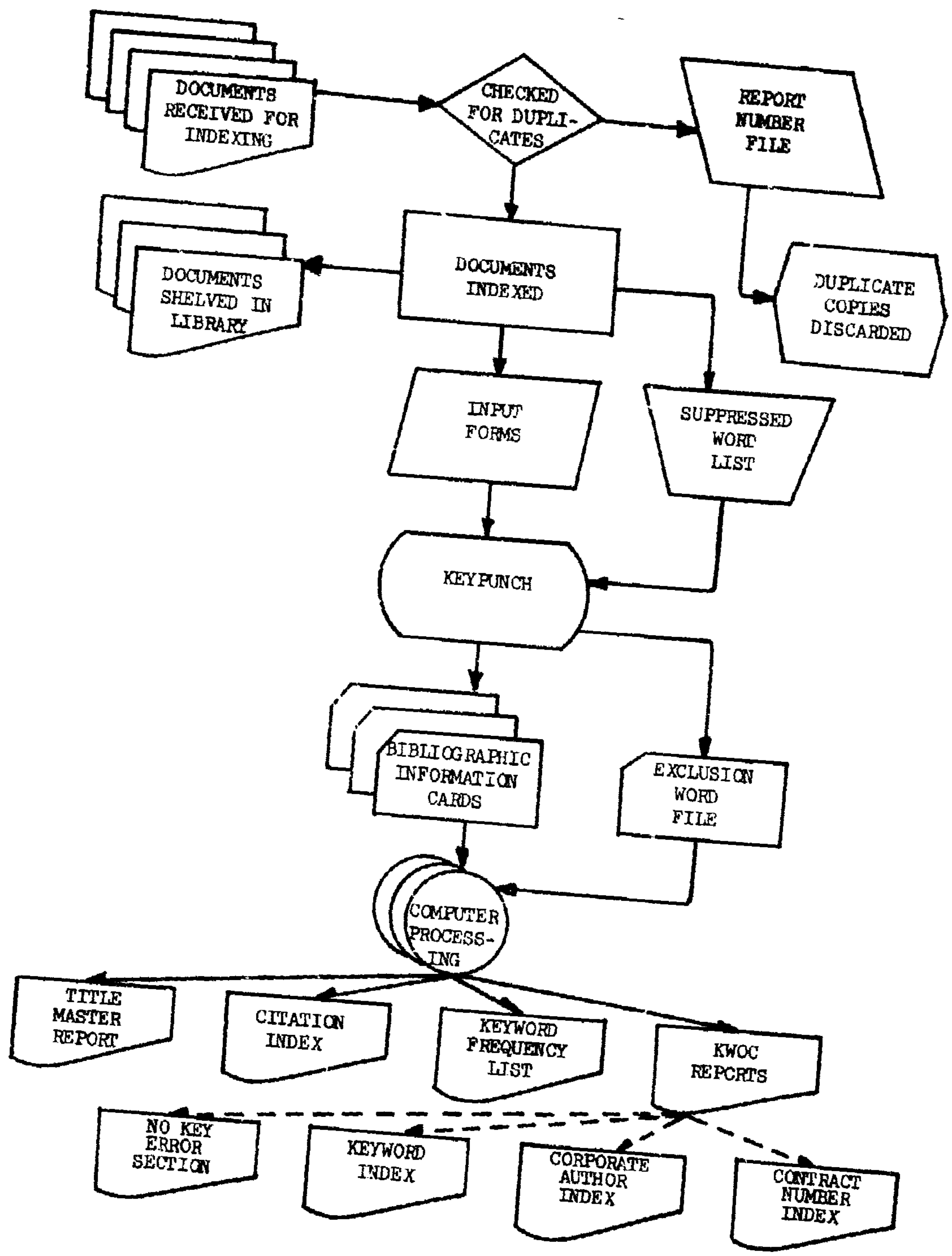


Figure 1 - Rapid Indexing System Basic Flow Chart

a. Receipt of Documents

b. Preparation of Report Number File

c. Indexing

d. Storing of Documents

e. Preparation of Computer Input Sheets

f. Keypunching

g. Computer Processing

h. Editing and Evaluating

The computer system is discussed in SECTION III and complete indexing procedures are presented in the Appendix.

a. Receipt of Documents

Several months prior to start of indexing, the AFRPL STINFO Office requested Laboratory personnel to cull their files for useful unclassified and confidential documents for which they had no immediate need. These documents were sent to a vault for temporary storage. As a result, approximately 1900 documents were available for indexing at start of the program.

A controlled flow of documents into the Lockheed Indexing Facility vault was essential to maintenance of the indexing schedule. To achieve this controlled flow, the STINFO Officer established a rotation schedule for each division to deliver its documents for indexing. Two men in each division were appointed as contacts for this purpose.

b. Report Number File and Duplication Check

Having determined that one copy each of the older documents was sufficient, a system was developed to eliminate duplicate copies before indexing. A report number/retrieval number file was established on 3" x 5" cards. Each document was checked against this file. If a card bearing the report number was on file, the document was discarded. If no card appeared, a retrieval number was assigned to the document and a report number/retrieval number card was made and filed.

While other methods of checking for duplicates were considered, none proved practical. In all cases, duplicate copies would have been indexed, input sheets typed, cards keypunched, and computer processes performed before duplication could be discovered either through manual scanning of printouts or automatically through an error detection code.

c. Indexing

The document itself was used as the indexer's worksheet. Through title page coding, the typist received the information required for filling out

the keypunch input forms. Detailed indexing procedures are presented in SECTION I of the Appendix and briefly described below.

(1) Document Cover Marking

Each document was assigned a unique, five-digit retrieval number. This number was written on the document's cover and served to identify the document in the computer printouts and on the library shelves.

(2) Title Page Coding

The title page was marked with a code keyed to the keypunch input sheet. Each sheet contained space for three documents. A keypunch input form, explaining the coding used on document title pages, is shown in Figure 2.

Since title pages do not contain the complete bibliographic information required in indexing, some data must be added as shown in Figure 3.

d. Storing of Documents

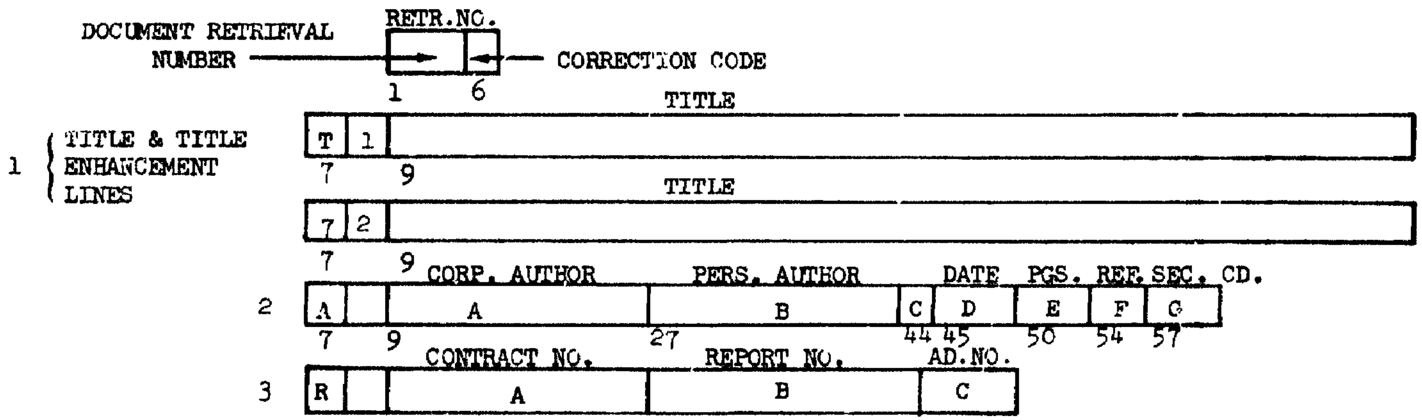
While remodeling of the AFRPL Library and construction of the adjoining vault was in progress, most reports were stored in a temporarily available vault after indexing. Others were returned to the individual collections from which they had been recalled for indexing.

Once remodeling and construction were completed, it was necessary for the Librarian to know the location of the documents so they could be recalled for central storage. To facilitate recall, the location and safe number of each indexed document returned to personal files was included as a title enhancement term.

The original plan was to house the entire document collection in the new vault adjacent to the library. Retrieval numbers were therefore assigned consecutively. It has since been decided to shelve unclassified documents in the library. This breaks the numbering sequence on the shelves. Therefore, it is not possible to determine, without checking the records, whether a document is out on load or shelved in the vault.

e. Input Sheets

Indexing information is typed on the keypunch input forms directly from the document's coded title page. This eliminates need for a worksheet. All letters are typed as capitals except the letter "o", which is typed in lower case, to distinguish it from zero. Figure 4 shows a typed keypunch input sheet.



2A - Corporate Author
2B - Personal Author
2C - Yields "et al" if an asterisk is entered
2D - Date of document
2E - Number of pages
2F - Number of references
2G - Security classification

3A - Contract Number under which document was written
3B - Primary report number
3C - Defense Documentation Center's "AD" number

Figure 2 - Keypunch Input Sheet Coded to Title Page Marking

LPC Report No. 689-Q-1
Copy No. ____

3B
TECHNICAL REPORT NO. [AFRPL-TR-65-108]

(Unclassified Title)

1 [DEVELOPMENT OF AN ELASTOMERIC SEAL FOR OMNIAXIAL MOVABLE NOZZLES (LOCKSEAL)
- - QUARTERLY REPORT NO. 1 /REP-LPC-689-Q-1, AFRPL-TR-65-108]

by

2A [LOCKHEED-PROPULSION COMPANY
Redlands, California

May 1965

to

AIR FORCE ROCKET PROPULSION LABORATORY
RESEARCH AND TECHNOLOGY DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE,
EDWARDS, CALIFORNIA

2D - May 65
2E - 108
2F - 3
2G - C

3A - AF04(611)-10537

LOCKHEED PROPULSION COMPANY
P. O. BOX 111
REDLANDS, CALIFORNIA

Figure 3 - Coding of Title Page

RETR.NO.

00836	

1 6

TITLE

T	1	DEVELoPMENT oF AN ELASToMERIC SEAL FoR oMNIAXIAL MoVABLE NoZZLES (LoCKS

7 9

TITLE

T	2	EAL) -- QUARTERLY REPoRT No. 1/REP-LPC-689-Q-1, AFRPL-TR-65-108

7	9	CORP. AUTHOR	PERS. AUTHOR	DATE	PGS	REF	SEC CD.
A		LoCKHEED-PRoP		MAY 65	108	3	c
7	9	27	44	45	50	54	57

7	9	CONTRACT NO.	REPORT NO.	AD NO.
R		AF04(611)-10537	AFRPL-TR-65-108	
7	9	27	45	

Figure 4 - Typed Keypunch Input Sheet Based upon Title Page Coding

f. Keypunching and Error Correction

Air Force personnel, using the information on the keypunch input sheets, keypunch a maximum of four cards per document. These bibliographic information cards and their functions are described in SECTION III.

The keypunch input sheet is also used for correction of errors detected in preliminary printouts. Column 6 of the Document Retrieval Number box has been set aside for the correction code. It is shown and labeled in Figure 2.

To make a change, the document's retrieval number is entered, followed by a change code. The letter "A" is used for the first change, "B" for a change that supersedes "A", and so forth. It is not necessary to fill in the entire form. Only additional or corrected information need be entered on the keypunch input form. Full procedure is covered in SECTION I of the Appendix.

g. Computer Processing and Reports

As indicated earlier, there are four computer reports providing three monitoring controls and four indexes. These are discussed in the order of their production as shown in Figure 1.

(1) Title Master Report

The Title Master Report is a listing of machine detectable errors. The sample shown in Figure 5 notes such errors as duplicate retrieval numbers, improper retrieval numbers, and retrieval numbers out of the range of the sequence being run. These errors are detected during the input data audit and the list compiled. They concern the document retrieval numbers and the four lines (T1, T2, A and R) on the keypunch input forms.

In Figure 5, the following errors are indicated:

- Two keypunch cards for line "T2" of retrieval number 07112,
- Two cards each for all lines (A, R, T1 and T2) of retrieval number 07113,
- Two cards for line "R" of 07455,
- Two "T1" cards for 07572,
- Two "A" cards for 07733,
- A non-existent line (line 2) for 07895, and
- An unacceptable retrieval or accession number (50240) since the highest number used in the sequence was 08280.

```
01                          TITLE MASTER LIST                          PAGE     6

THE FØLLØWING CARDS CØNTAIN DUPLICATE CØDES.
    07112 T2/PERFLUØRØGUANIDINE, ISØCYANATE
    07112 T2M CØMPØNENTS -- MØNTHLY REPØRT. /SPACE-VEHICLES, ALUMINUM, TEFLØN

THE FØLLØWING CARDS CØNTAIN DUPLICATE CØDES.
    07113 A JET PRØPULSIØN L  MECHREBLIAN, R V  JUL6111  8  U
    07113 A JET PRØPULSIØN L  MEGHREBLIA N, R V JUL6111  8  U

THE FØLLØWING CARDS CØNTAIN DUPLICATE CØDES.
    07113 R DA-01-021-AMC11735
    07113 R NASW-6            TECH-REP-32-139

THE FØLLØWING CARDS CØNTAIN DUPLICATE CØDES.
    07113 T1RESEARCH ØN ADVANCED SØLID-PRØPELLANTS -- QUARTERLY REPØRT NØ. 66-2.
    07113 T1THERMAL RADIATIØN IN GASEØUS FISSIØN REACTØRS FØR PRØPULSIØN. /RADIATIØN

THE FØLLØWING CARDS CØNTAIN DUPLICATE CØDES.
    07113 T2/PERFLUØRØGUANIDINE, SENSITIVITY, AMMØNIUM
    07113 T2, HYDRØGEN

THE FØLLØWING CARDS CØNTAIN DUPLICATE CØDES.
    07455 R AF33(657)-11303   IR-8-150-14
    07455 R AF33(657)-11303   IR-8-150-14

THE FØLLØWING CARDS CØNTAIN DUPLICATE CØDES.
    07572 T1NITRØGEN-TETRØXIDE HANDLING MANUAL. /SSD-TR-61-8, REP-R-3135, HAZARDS,
    07572 T1NITRØGEN-TETRØXIDE HANDLING MANUAL. /SSD-TR-61-8, REP-R-3135, HAZARDS,

THE FØLLØWING CARDS CØNTAIN DUPLICATE CØDES.
    07733 A UNITED TECHNØLØGY LAWRENCE, W J     DEC6554  7  C
    07733 A UNITED TECHNØLØGY LAWRENCE, W J     DEC6554  7  C

THE FØLLØWING CARD CØNTAINS AN IMPRØPER CØDE.
    07895 2 28. /REACTØRS, NUCLER-PØWER

THE FØLLØWING ACCESSIØN NUMBER IS ØUT ØF RANGE
    50240 T1SYNTHESIS ØF CARBAMATES -- THEIR CHEMICAL, PHYSICAL AND ELECTRØCHEMICAL
```

FIGURE 5 - TITLE MASTER ERROR LIST

(2) **Citation Index**

The Citation Index is the only report providing complete bibliographic information and is similar to the shelf list of a library's card catalog. It provides essentially the same information and represents the numerical order of the actual documents on the library's shelves. A sheet of this printout is shown in Figure 6.

In addition to information brought out in other indexes this index includes:

- Corporate author
- Personal author
- Contract number
- Primary report number
- AD number
- Date of document
- Number of pages
- Number of references
- Security classification

Many documents do not contain all the elements which the Citation Index can accommodate. For example, document number 00836, which is shown in each of the index printouts illustrated, there are neither personal authors nor an AD number.

(3) Keyword Frequency List

The indexing system automatically produces a report, in alpha-numeric order, of all keywords used. Frequency of each term's occurrence is tabulated in the format shown in Figure 7. This printout serves several useful functions. It simplifies detection of keyword errors. It quickly identifies areas in which keywords are overused. It aids in subsequent indexing by enabling standardization of hyphenated terms. It represents the complete vocabulary used in indexing and thereby forms the basis for a thesaurus.

Truncated keywords are terms containing over 18 characters that are automatically cut off by the computer at the 18th letter. These terms also appear on the Keyword Frequency List together with the document retrieval numbers. The document retrieval number permits rapid location of the complete term in the Citation Index.

```
                     CITATION INDEX    01                                          PAGE   90
RETRIEVAL NO.                                     CITATION

    00835    LIQUID PROP INF AG
               HYBRID-PROPULSION SYSTEMS -- HYBRID-PROPULSION SYSTEMS SYMPOSIUM, 4-5
               OCTOBER 1961.
                                                      LPIA-LSH-1            AD
               JAN62 PGS169  REFS     SEC CD C

    00836    LOCKHEED-PROP
               DEVELOPMENT OF AN ELASTOMERIC SEAL FOR OMNIAXIAL MOVABLE NOZZLES
               (LOCKSEAL) -- QUARTERLY REPORT NO. 1. /REP-LPC-689-Q-1, AFRPL-TR-65-108
                                   AF04(611)-10537     AFRPL-TR-65-108     AD
               MAY65 PGS108  REFS3    SEC CD C

    00837    LOCKHEED-PROP
               DEVELOPMENT OF AN ELASTOMERIC SEAL FOR OMNIAXIAL MOVABLE NOZZLES
               (LOCKSEAL) -- PROGRESS REPORT NO. 2. /REP-LPC-689-Q-2, AFRPL-TR-65-173
                                   AF04(611)-10537     AFRPL-TR-65-173     AD
               AUG65 PGS104  REFS     SEC CD C

    00838    LOCKHEED-PROP
               EXPLORATORY DEVELOPMENT PROGRAM FOR A LIGHTWEIGHT SOLID ROCKET PULSE
               MOTOR, 6 NOV 1964 - 30 APR 1965. /REP-LPC-683-S-1, AFRPL-TR-65-115
                                   AF04(611)-9716      AFRPL-TR-65-115     AD
               MAY65 PGS58   REFS4    SEC CD C

    00839    LOCKHEED-PROP
               EXPLORATORY DEVELOPMENT PROGRAM FOR A LIGHTWEIGHT SOLID-ROCKET PULSE
               MOTOR, 1 MAY 1965 - 31 JULY 1965. /REP-LPC-683-Q-1, AFRPL-TR-65-165
                                   AF04(611)-9716      AFRPL-TR-65-165     AD
               AUG65 PGS56   REFS     SEC CD C

    00840    LOCKHEED-PROP
               GRAIN DESIGN FOR HYBRID-MOTORS. /FUELS
                                   DA-04-495-ORD-3577 LPC-594-S-1          AD
               JAN63 PGS49   REFS     SEC CD C

    00841    LOCKHEED-PROP
               HYBRID-PROPULSION RESEARCH PROGRAM -- 1ST QUARTERLY REPORT. /LITHIUM-HYD
               RIDES, RUBBER, ALUMINUN
                                   DA-04-495-ORD-3577 LPC-594-Q-1          AD
               OCT62 PGS137  REFS12   SEC CD C

    00842    LOCKHEED-PROP
               HYBRID-PROPULSION RESEARCH PROGRAM -- 2ND QUARTERLY REPORT. /LITHIUM-HYD
               RIDES, RUBBER, ALUMINUM
                                   DA-04-495-ORD-3577 LPC-594-Q-2          AD
               JAN63 PGS115  REFS12   SEC CD C

    00843    LOCKHEED-PROP
               HYBRID-PROPULSION RESEARCH-PROGRAM -- 3RD QUARTERLY REPORT. /LITHIUM-HYD
               RIDES, RUBBER, NITROGEN-TETROXIDE
                                   DA-04-495-ORD-3577 LPC-594-Q-3          AD
               APR63 PGSVP   REFS     SEC CD C
```

FIGURE 6 - CITATION INDEX

KEYWORD	FREQ	KEYWORD RETRIEVAL LIST NUM	KEYWORD	FREQ	RETRIEVAL NUM	KEYWORD	PAGE FREQ
U-DETA	1		UTAH	1		VINYLTETRAZOLES	1
U-DIMETHYLHYDRAZIN	1	04075	UTILIZATION	1		VIOLET	1
UDMH	2		U233	1		VISCOSITY	10
ULEXITE	2		U235	1		VISIBLE	1
ULLAGE	1		V-1	1		VISTANEX-ALUMINUM	1
ULTIMATE	1		VACUUM	5		VISUAL	1
ULTRA	6		VACUUM-TECHNIQUES	2		VISUAL-TYPE	1
ULTRA-HIGH	15		VALUE	1		VOLATILITIES	1
ULTRA-LOW-CHAMBER	1		VALUES	3		VOLTAGE	2
ULTRA-VIOLET	1		VALVE	1		VOLUMES	1
ULTRAFINE	1		VALVES	3		VOLUMETRIC	3
ULTRASONIC	6		VANADIUM	2		VORTEX	12
ULTRAVIOLET	3		VANES	1		VORTEX-FLOW	1
UNCATALYSED	1		VANGUARD	2		VORTEX-FLOWS	1
UNCATALYZED	1		VAPOR	2		VORTEX-STABILIZED	9
UNCLASSIFIED	3		VAPOR-BINDING	1		VORTEX-TUBE	2
UNCOOLED	2		VAPOR-DETECTION	1		VULNERABILITY	1
UNCURED	1		VAPOR-LIQUID	4		WALL	4
UNDERSEA-WARFARE	1		VAPOR-PHASE	6		WARHEAD	3
UNDERSTANDING	1		VAPOR-PRESSURE	9		WARNING-DEVICES	2
UNDERWATER	2		VAPOR-PRESSURES	2		WASHINGTON	3
UNEXPECTED	1		VAPORIZATION	11		WASTE	1
UNGUIDED	1		VARIABLE	2		WATER	30
UNIFIED	1		VARIABLES	2		WATER-CONTENT	1
UNIQUE	4		VARIANTS	1		WATER-COOLED	1
UNITED-KINGDOM	3		VECTOR	1		WATER-MODERATED	1
UNIVERSITY	2		VECTOR-CONTROL	1		WATER-MOLECULES	1
UNREACTED	1		VEHICLE	10		WATER-REACTIVE	1
UNSATURATED	2		VEHICLES	13		WAVE	2
UNSATURATION	1		VELOCITIES	3		WAVE-PROPAGATION	2
UNSOLVATED	1		VELOCITY	17		WAVES	4
UNSTABLE	11		VENTED	2		WAX	1
UNSTEADY	1		VERBAL	1		WEAK	1
UNSTEADY-STATE	1		VERIFICATION	1		WEAPON	1
UNSYMMETRICAL	5		VERNIER	1		WEAPON-A	1
UNSYMMETRICAL-DIME	1	03832	VERTICAL	1		WEAPONS	3
UO2	2		VESSEL	2		WEAR	1
UPPER	4		VIBRATION	5		WEAR-EVALUATION	1
UPPER-STAGE	1		VIBRATION-LABORATO	1	03951	WEIGHED	1
UPPER-STAGES	2		VIBRATIONAL	2		WEIGHT	5
UPRATED	3		VIBRATIONAL-METHOD	1	00636	WEIGHT-PERCENT	1
UPTAKE	1		VIBRATIONS	1		WEIGHTS	2
URANIUM	8		VIKING	3		WELDED	1
URANIUM-DIOXIDE	1		VINYL	9		WELDING	7
URANIUM-LOADED	2		VINYL-CHLORIDE	1		WERKS	1
UREA	3		VINYL-POLYMER	1		WFNA	18
UREAS	1		VINYL-POLYMERS	2		WFNA-AMMONIA	1
URETHANE	1		VINYLATION	1		WHEEL	1
USEFUL	1		VINYLENETETRABORAN	1	03624	WHITE	38
USEFULNESS	1		VINYLITE	1		WHITE-FUMING	1

FIGURE 7 - KEYWORD FREQUENCY LIST

(4) KWOC Report

The KWOC Report is divided into four sections: No Key Error section, Keyword Index, Corporate Author Index, and Contract Number Index. Since the indexes are sections of the same report, they all appear in the same format.

The Keyword Index has been further subdivided into a report number index and a document location index by manipulation of terms rather than through computer programming. These indexes occur within the body of the Keyword Index and therefore are not shown on the flow chart (Figure 1).

(a) No Key Error

This is the first of the four KWOC sections. Refer to flow chart, Figure 1. The No Key Error section is a safeguard against the possibility of a document not appearing in any portion of the Keyword Index due to absence of keywords in the title. In actual practice this report was never needed, since the indexer had always provided necessary keywords as title enhancement terms.

(b) Keyword Index and Title Enhancement

This is the second of the KWOC sections shown in Figure 1. Significant words in the title provide the indexing terms under which a document can be retrieved. As shown in Figure 8, this index is an alphabetical listing of keywords followed by the titles containing them. Each keyword appears only once unless the number of entries under a term continues on the following page. In that event, the keyword is repeated at the top of the new page.

Each entry under a keyword contains the full title, title enhancment terms, date of report, and retrieval number. Security classification of the title is not given since only unclassified information appears in the printout.

Keywords are limited to 18 characters, thereby eliminating the possibility of such combined terms as ENGINE-OPTIMIZATION and MECHANICAL-PROPERTIES. Should a space occur between two words of a combined term, each term will index separately. In MECHANICAL PROPERTIES, for instance, mechanical will appear under the "M's" and properties under the "P's".

Numbers preceding letters are automatically dropped. A term such as 5KS4500 will index as KS4500.

Keywords which do not occur in a title cannot appear as indexing points in the Keyword Index. Terms in a title may be combined by joining them with hyphens and they may be simply transposed, but radical changes of the title are not permitted.

KWOC INDEX PAGE 627

KEY WORD	TITLE	DATE	RETRIEVAL NUMBER
LMH-2	CRYSTALLOGRAPHIC STUDIES ON LMH-2 -- FINAL REPORT. /BERYLLIUM, DIFFRACTION, DENSITY, AFRPL-TR-65-230		02677
	SYNTHESIS OF LMH-2 -- FINAL REPORT. /BERYLLIUM, HYDRIDES, CRYSTALLIZATION, AFRPL-TR-66-15	OCT65	02711
	SYNTHESIS OF LMH-2 -- QUARTERLY REPORT. /BERYLLIUM, HYDRIDES, PURITY, CHLORIDES, ETHER, AFRPL-TR-66-195	AUG66	02712
	SYNTHESIS OF LMH-2 -- QUARTERLY REPORT NO. 2. /BERYLLIUM, HYDRIDES, CRYSTALLIZATION	OCT64	02730
	SYNTHESIS OF LMH-2 -- QUARTERLY REPORT NO. 3. /BERYLLIUM, HYDRIDES, CRYSTALLIZATION	JAN65	02731
LOADED	DAMAGE STUDIES OF EXPLOSIVE LOADED FIN ASSEMBLIES OF SPARROW, SIDEWINDER, AND FALCON DESIGN. /REP-NOTS-1625	MAY57	00991
	5.00-INCH MARK 4 MOD 1 ROCKET MOTORS LOADED WITH MARK 22 MOD 3 PROPELLANT GRAINS.	FEB54	01086
LOADING	EFFECT OF LOADING DENSITY ON THE HEAT-OF-EXPLOSION MEASUREMENT. /REP-TR-103	APR58	01080
	STRESS CONCENTRATION IN POLYMERS AS A FUNCTION OF LOADING RATE.	JAN57	01338
	FINAL REPORT ON THE LOADING, TESTING AND DELIVERY OF XM 85 ROCKET MOTORS. /MOTOR-XM-85, REP-TR-PL-6504, RPL-TDR-64-78	DEC64	02650
LOCAL	EFFECT OF LOCAL VARIATIONS IN MIXTURE RATIO ON ROCKET PERFORMANCE. /COMBUSTION	JAN51	00656
LOCATING	FEASIBILITY OF LOCATING FACILITIES FOR CONVERSION OF GUANIDINE NITRATE TO NITROGUANIDINE AT EXISTING PROPELLANT PLANT SITES.	FEB58	01271
LOCKSEAL	DEVELOPMENT OF AN ELASTOMERIC SEAL FOR OMNIAXIAL MOVABLE NOZZLES (LOCKSEAL) -- QUARTERLY REPORT NO. 1. /REP-LPC-689-Q-1, AFRPL-TR-65-108	MAY65	00836
	DEVELOPMENT OF AN ELASTOMERIC SEAL FOR OMNIAXIAL MOVABLE NOZZLES (LOCKSEAL) -- PROGRESS REPORT NO. 2. /REP-LPC-689-Q-2, AFRPL-TR-65-173	AUG65	00837
	LOCKSEAL JOINT FOR ROCKET COMPONENTS. /REP-NOTS-1492	OCT57	01027
LOG-PROBABILITY	PROPELLANT VAPORIZATION A CRITERION FOR ROCKET-ENGINE DESIGN - CALCULATIONS USING VARIOUS LOG-PROBABILITY DISTRIBUTIONS OF --/SAFE-RPC-634-6	OCT57	05130
LOGISTICS	NUCLEAR LUNAR LOGISTICS STUDY PRESENTATION 18 JULY 1963. /SPACE-VEHICLES, REP-LMSC-NSP-63-85	JUL63	02375
	NUCLEAR LUNAR LOGISTICS STUDY PRESENTATION 10 OCTOBER 1963. /SPACE-VEHICLES, REP-LMSC-NSP-63-114	OCT63	02376
	COMPARISON OF LIQUID-OXYGEN AND WFNA AS ROCKET PROPELLANTS - USE AND LOGISTICS. /NITRIC-ACID, SAFE-RPC-634-8	JUN50	05227

FIGURE 8 - KEYWORD INDEX

The indexer can use various devices to index each document adequately within the computer imposed restrictions. These methods are treated extensively in the Appendix. He may, for example, transpose 5KS4500 MOTOR to MOTOR-5KS4500.

The phrase "...process for recovery of uranium..." would not be altered. However, the combined term URANIUM-RECOVERY can be added as a title enhancement term. Such terms are separated from the actual title by a virgule (/).

Such a system imposes a number of restrictions upon the indexer. Operating within these limitations, the indexer must exercise a high degree of skill and judgement to index each document properly.

A Report Number Index was produced by adding originating agency and issuing agency report numbers as title enhancement terms. The computer printouts (Figures 8, 9, and 10) illustrate this method for document number 00836. In Figure 8, the Lockheed Propulsion Company (LPC) and Air Force Rocket Propulsion Laboratory report numbers have been added as title enhancement terms.

Since title enhancement terms appear as keywords, the various report numbers can be easily located. Figure 9 shows the AFRPL report number entry and Figure 10 illustrates the originating agency's report number as a keyword. Report numbers, other than AFRPL, are prefixed by REP to bring them together in the index. As explained in SECTION IV, paragraph 3c(2), these entries have been gathered into a single section of the book catalog.

A Document Location Index became necessary because all documents could not be stored initially in the same location. A location code was developed to indicate the safe number in which each document was stored. This code became a keyword to produce the Keyword Index entries shown in Figure 11.

(c) Corporate Author Index

This is the third KWOC report section illustrated in Figure 1. To overcome the 18-character corporate author limitation, standard abbreviations were established. For the most part these abbreviations are easily recognizable. However, to avoid any possible difficulties, Section 2 of the appendix has been divided into three sections for the benefit of the user and the indexer. Part 1 is specifically for the index user and lists the 18-character corporate author abbreviations followed by the full corporate author name. Part 2 is the tool of the indexer and lists the full corporate author followed by the 18-character abbreviation. To ensure, insofar as possible, consistency in the abbreviations and thereby make the abbreviations even more intelligible.

KEY WØRD	KWØC INDEX TITLE PAGE 42	DATE	RETRIEVAL NUMBER
AFRPL-TR-64-178	A STUDY ØF SYSTEM-CØUPLED LØNGITUDINAL INSTABILITIES IN LIQUID-RØCKETS - - SPECIAL REPØRT NØ. 1 - ANALYTIC MØDEL. /CØMPUTERS, AFRPL-TR-64-178	APR65	06889
AFRPL-TR-64-180	FEASIBILITY DEMØNSTRATIØN FØR DIRECT-CHAMBER-BLEED HØT-GAS SECØNDARY INJECTIØN THRUST-VECTØR-CØNTRØL -- QPR NØ. 2. /AFRPL-TR-64-180	DEC64	06008
AFRPL-TR-64-181	SØLID-PRØPELLANT SYNTHESIS AND EVALUATIØN -- SEMI ANNUAL REPØRT NØ. 1. / STØRAGE, PURIFICATIØN, INFØ-635, ALUMINUM, HYDRIDES AFRPL-TR-64-181	DEC64	02531
AFRPL-TR-64-182	MANEUVERING SATELLITE PRØPULSIØN - SYSTEM DEMØNSTRATIØN -- QUARTERLY REPØRT. /AFRPL-TR-64-182, MATERIALS, FLUØRINE, INJECTØRS	JAN65	06020
AFRPL-TR-64-184	EXPERIMENTAL EVALUATIØN ØF ADVANCED LIQUID-PRØPELLANTS -- SEMI ANNUAL REPØRT NØ. 4. /GELS, HYDRAZINE, HYDRØGEN-PERØXIDE, AFRPL-TR-64-184	DEC64	07741
AFRPL-TR-65-101	AFRPL LIQUID-FLUØRINE RØCKET-NØZZLE TEST-FACILITY. /AFRPL-TR-65-101	MAY65	06239
AFRPL-TR-65-102	INVESTIGATIØN ØF HIGH-ENERGY ØXIDIZER BINDERS FØR SØLID-PRØPELLANTS. /RE P-1734, ØXYGEN, DIFLUØRIDE, AFRPL-TR-65-102	JAN60	00017
AFRPL-TR-65-103	HIGH-PRESSURE RESEARCH TØWARD HIGH-ENERGY PRØPELLANTS -- APRIL 1, 1964 - MAR 31, 1965. /BUTENE, PRØPANE, PERFLUØRØGUANIDINE, AFRPL-TR-65-103	JUN65	05558
AFRPL-TR-65-104	SYNTHESIS ØF HIGH-ENERGY PØLYMERS AND SØLID ØXIDIZERS -- FINAL REPØRT, JANUARY 1, 1964 - MARCH 31, 1965. /DIFLUØRAMINØ, AFRPL-TR-65-104	JUN65	00831
AFRPL-TR-65-106	DEVELØPMENT ØF HIGH-ENERGY SØLID-PRØPELLANT FØRMULATIØNS. /REP-TR-PL-887 3, BERYLLIUM, SAFE-565-4, AFRPL-TR-65-106	MAR66	02134
AFRPL-TR-65-108	DEVELØPMENT ØF AN ELASTØMERIC SEAL FØR ØMNIAXIAL MØVABLE NØZZLES (LØCKSEAL) -- QUARTERLY REPØRT NØ. 1. /REP-LPC-689-Q-1, AFRPL-TR-65-108	MAY65	00836
AFRPL-TR-65-11	HIGH-ENERGY SØLID-PRØPELLANT EFFICIENCY INVESTIGATIØN. /REP-TR-PL-8623 AFRPL-TR-65-11	JUL65	00206
AFRPL-TR-65-115	EXPLØRATØRY DEVELØPMENT PRØGRAM FØR A LIGHTWEIGHT SØLID RØCKET PULSE MØTØR, 6 NØV 1964 - 30 APR 1965. /REP-LPC-683-S-1, AFRPL-TR-65-115	MAY65	00838
AFRPL-TH-65-116	SØLID-PRØPELLANT SYNTHESIS AND EVALUATIØN -- SEMI ANNUAL REPT NØ. 2. /ALUMINUM, HYDRIDES, INFØ-635, NITRØGEN, FLUØRINE, AFRPL-TR-65-116	MAY65	02603
AFRPL-TR-65-118	EVALUATIØN ØF PRØPELLANT CØNTAINMENT AND VENTING DEVICES FØR ZERØ-GRAVIT Y APPLICATIØNS. /AFRPL-TR-65-118, SCREENS, CAPILLARIES	JUN65	07693
AFRPL-TR-65-119	CHARACTERIZATIØN AND EVALUATIØN ØF LIGHT-METAL HYDRIDES -- QR NØ. 7. /BE RYLLIUM, SURVEILLANCE, DNESITY, REP-LPC-637-Q-7, AFRPL-TR-65-119	MAY65	02672
AFRPL-TR-65-12	LIGHT METAL CØMBUSTIØN EFFICIENCY INVESTIGATIØN. /BERYLLIUM, REP-TR-PL-8089, AFRPL-TR-65-12	MAR65	00195
AFRPL-TR-65-122	STUDY, DESIGN, ANALYSIS, FABRICATIØN, AND TEST ØF A SØLID-PRØPELLANT PULSE RØCKET-MØTØR -- FINAL REPT VØL I. /REP-LPC-654-F, AFRPL-TR-65-122	AUG65	00853

FIGURE 9 - ISSUING AGENCY REPORT NUMBER INDEX

KEY WØRD	TITLE	DATE	RETRIEVAL NUMBER
REP-LPC-614-F	DESIGN AND DEVELØPMENT ØF THE HIGH-EXPANSIØN-RATIØN RØCKET-MØTØR. /RPL-TDR-64-31, REP-LPC-614-F, NØZZLES, SPECIFIC-IMPULSE	MAR64	07301
REP-LPC-622-F	156-INCH DIAMETER MØTØR JET TAB TVC PRØGRAM - FINAL REPØRT -- VØLUME III . /AFRPL-TR-64-167, REP-LPC-622-F, THRUST-VECTØR-CØNTRØL, NØZZLES	JAN65	07671
REP-LPC-622-Q-4	156-INCH DIAMETER MØTØR JET TAB TVC PRØGRAM -- QUARTERLY REPØRT. /RPL-TDR-64-77, REP-LPC-622-Q-4, THRUST-VECTØR-CØNTRØL	JUN64	07659
REP-LPC-628-F-VØL1	AN INVESTIGATIØN ØF THE CHARACTERISTICS ØF HYBRID-PRØPULSIØN SYSTEMS. /FINAL REPØRT VØL I, LITHIUM-HYDRIDES, PØLYBUTADIENE, REP-LPC-628-F-VØL1	DEC63	00850
REP-LPC-628-F-VØL2	AN INVESTIGATIØN ØF CHARACTERISTICS ØF HYBRID-PRØPULSIØN SYSTEMS. /FINAL REPØRT VØL II, LITHIUM-HYDRIDES, PØLYBUTADIENE, REP-LPC-628-F-VØL2	DEC63	00851
REP-LPC-628-Q-1	AN INVESTIGATIØN ØF THE CHARACTERISTICS ØF HYBRID-PRØPULSIØN SYSTEMS. /QUARTERLY REPØRT NØ. 1, LITHIUM-HYDRIDES, PØLYBUTADIENE REP-LPC-628-Q-1	JUL63	00849
REP-LPC-637-Q-5	CHARACTERIZATIØN AND EVALUATIØN ØF LIGHT-METAL HYDRIDES -- QR NØ. 5. /BERYLLIUM, SURVEILLANCE, CØMBUSTIØN, REP-LPC-637-Q-5 AFRPL-TR-64-142	ØCT64	02670
REP-LPC-654-Q-1	STUDY, DESIGN, ANALYSIS, FABRICATIØN AND TEST ØF A SØLID-PRØPELLANT PULSE RØCKET-MØTØR -- QUARTERLY REPØRT NØ. 1. /RPL-TDR-64-64,REP-LPC-654-Q-1	APR64	07658
REP-LPC-666-F	A STUDY ØF STØRABLE PREPACKAGED HYBRID-PRØPULSIØN SYSTEMS -- FINAL REPØRT. /LITHIUM-HYDRIDES, REP-LPC-666-F, AFRPL-TDR-65-37	MAR65	00857
REP-LPC-666-Q-1	A STUDY ØF STØRABLE PREPACKAGED HYBRID-PRØPULSIØN SYSTEMS -- QUARTERLY REPØRT NØ. 1. /LITHIUM-HYDRIDES, REP-LPC-666-Q-1, AFRPL-TDR-64-132	SEP64	00856
REP-LPC-683-Q-1	EXPLØRATØRY DEVELØPMENT PRØGRAM FØR A LIGHTWEIGHT SØLID-RØCKET PULSE MØTØR, 1 MAY 1965 - 31 JULY 1965. /REP-LPC-683-Q-1, AFRPL-TR-65-165	AUG65	00839
REP-LPC-683-S-1	EXPLØRATØRY DEVELØPMENT PRØGRAM FØR A LIGHTWEIGHT SØLID RØCKET PULSE MØTØR, 6 NØV 1964 - 30 APR 1965. /REP-LPC-683-S-1, AFRPL-TR-65-115	MAY65	00838
REP-LPC-689-Q-1	DEVELØPMENT ØF AN ELASTØMERIC SEAL FØR ØMNIAXIAL MØVABLE NØZZLES (LØCKSEAL) -- QUARTERLY REPØRT NØ. 1. /REP-LPC-689-Q-1, AFRPL-TR-65-108	MAY65	00836
REP-LPC-689-Q-2	DEVELØPMENT ØF AN ELASTØMERIC SEAL FØR ØMNIAXIAL MØVABLE NØZZLES (LØCKSEAL) -- PRØGRESS REPØRT NØ. 2. /REP-LPC-689-Q-2, AFRPL-TR-65-173	AUG65	00837

FIGURE 10 - ORIGINATING AGENCY REPORT NUMBER INDEX

KEY WØRD	TITLE	DATE	RETRIEVAL NUMBER
SAFE-RPC-620-1	HYDRØGEN-PERØXIDE BY ØXIDATIØN ØF ISØPRØPYL-ALCØHØL -- PRØGRESS REPØRT. /ACETØNE, PURIFICATIØN, SAFE-RPC-620-1	DEC51	03355
	HYDRØGEN-PERØXIDE BY ØXIDATIØN ØF ISØPRØPYL-ALCØHØL -- PRØGRESS REPØRT. /DETØNATIØN, PURIFICATIØN, SAFE-RPC-620-1	JAN52	03356
	HYDRØGEN-PERØXIDE BY ØXIDATIØN ØF ISØPRØPYL-ALCØHØL -- PRØGRESS REPØRT. /DETØNATIØN, STØRAGE, SAFE-RPC-620-1	FEB52	03357
	HYDRØGEN-PERØXIDE BY ØXIDATIØN ØF ISØPRØPYL-ALCØHØL -- PRØGRESS REPØRT. /DETØNATIØN, PURIFICATIØN, SAFE-RPC-620-1	MAY52	03358
	AN INVESTIGATIØN ØF MIXING IN BENDS. /DUCTS, FLØW, REP-TR-AE5508, SAFE-RPC-620-1	DEC55	03359
	RESEARCH AND DEVELØPMENT ØN HIGH-TEMPERATURE FUEL-RESISTANT RUBBER CØMPØUNDS. /AMINES, MAGNESIUM-ØXIDE, SAFE-RPC-620-1	MAY59	03360
	DEVELØPMENT ØF A GAS-GENERATØR FØR BØUNDARY-LAYER CØNTRØL -- FINAL ENGINEERING REPØRT. /NØZZLES, INJECTØRS, SAFE-RPC-620-1	SEP54	03361
	PRØCEEDINGS ØF THE 2ND MØNØPRØPELLANT CØNFERENCE. /ACETYLENE, NITRATES, HYDRAZINE, SYMPØSIA, SAFE-RPC-620-1	ØCT55	03362
	INVESTIGATIØN ØF NEW MØNØFUELS -- FINAL REPØRT. /ETHYLENE-ØXIDE, NITRATES, PRØPYNE, SAFE-RPC-620-1	FEB54	03363
	SELECTED BIBLIØGRAPHY ØN SEVEN MØNØPRØPELLANTS. /ETHYL-NITRATE, ETHYLENE-ØXIDE, HYDRAZINE, HYDRØGEN-PERØXIDE, SAFE-RPC-620-1	MAY54	03364
SAFE-RPC-620-2	AN INVESTIGATIØN ØF MØNØPRØPELLANTS FØR THE NAVY. /ETHYLENE-ØXIDE, SAFE-RPC-620-2	FEB50	03365
	LIQUID-MØNØPRØPELLANT INVESTIGATIØN -- PRØGRESS REPØRT NØ. 2. /ETHYLENE-ØXIDES, PRØPYLENE-ØXIDES, SAFE-RPC-620-2	APR50	03366
	LIQUID-MØNØPRØPELLANT INVESTIGATIØN -- PRØGRESS REPØRT NØ. 3. /ETHYLENE-ØXIDES, PRØPYLENE-ØXIDES, CATALYSTS, SAFE-RPC-620-2	JUN50	03367
	LIQUID-MØNØPRØPELLANT INVESTIGATIØN -- PRØGRESS REPØRT NØ. 4. /ETHYLENE-ØXIDES, PRØPYLENE-ØXIDES, CATALYSTS, SAFE-RPC-620-2	AUG50	03368
	LIQUID-MØNØPRØPELLANT INVESTIGATIØN -- PRØGRESS REPØRT NØ. 5. /ETHYLENE-ØXIDES, PRØPYLENE-ØXIDES, DECØMPØSITIØN, ADDITIVES, SAFE-RPC-620-2	ØCT50	03369
	LIQUID-MØNØPRØPELLANT INVESTIGATIØN -- PRØGRESS REPØRT NØ. 6. /ETHYLENE-ØXIDES, PRØPYLENE-ØXIDES, DECØMPØSITIØN, SAFE-RPC-620-2	DEC50	03370
	LIQUID-MØNØPRØPELLANT INVESTIGATIØN -- PRØGRESS REPØRT NØ. 7. /ETHYLENE-ØXIDES, NØZZLES, THRUST, SAFE-RPC-620-2	FEB51	03371
	LIQUID-MØNØPRØPELLANT INVESTIGATIØN -- PRØGRESS REPØRT NØ. 8. /REACTØRS, INJECTØRS, SAFE-RPC-620-2	APR51	03372

FIGURE 11 - DOCUMENT LOCATION INDEX

Part 3 contains a standardized listing of the most frequently used abbreviations. A sample of the corporate author index is shown in Figure 12. This section is in the same format and contains the same information as the Keyword Index. As far as the computer program is concerned, both indexes are part of the same KWOC report. The corporate authors have been removed from the keyword alphabetical sequence for convenience of the user.

This method was selected to provide useful bibliographic information concerning the documents listed under each corporate author. The alternative would be to list only the retrieval numbers of each document. Each sheet would then contain three columns of corporate authors instead of one. However, it would be necessary to consult the Citation Index to identify each document.

Provision has been made for only one personal author. Should more than one occur, column 44 of line 3 of the keypunch input sheet (Figure 4) provides for an asterisk. The computer interprets the asterisk and prints out "et al", thus indicating that the document was written by more than one author. Since there is no personal author index, this information is part of the Citation Index (Figure 5).

(d) Contract Number Index

The fourth section of the KWOC Report is the Contract Number Index illustrated in Figure 13. As in all previous indexes, each entry yields the full title, title enhancement terms, date of the document, and retrieval number.

h. Editing and Cumulating

A preliminary, two copy printout was obtained of each non-cumulative run for editing and correcting. A five copy run of the corrected version was then obtained for distribution. Cumulative printouts consisted of merging several printouts which had already been corrected.

(1) Editing and Correction

As indexing progressed it became increasingly evident that some control over vocabulary was necessary. Some terms had variant forms, BI-PROPELLANT and BIPROPELLANT for example. Such variations are widely separated in computer alphabetization. Other terms were meaningless if left unhyphenated. US AIR FORCE indexes under US, AIR, and FORCE. Some terms, such as PROPELLANT, gather far too many entries to be of practical use. These weaknesses of a title-based indexing system were overcome through editing preliminary printouts. The resultant Keyword Frequency List was used as a thesaurus for consistency in subsequent indexing.

KWOC INDEX PAGE 100

KEY WORD	TITLE	DATE	RETRIEVAL NUMBER
LINDE AIR PROD	PROJECT LADDIE. /LIQUID-OXYGEN, STORAGE, SAFE-RPC-637-7	JAN52	03817
	RESEARCH ON THE PROPERTIES OF OZONE -- 1950-1955 FINAL REPORT. /OXYGEN, SAFE-RPC-637-7		03820
LINK ORDNANCE DIV	IMPROVEMENT OF IGNITION SYSTEM FOR SIMULTANEOUS IGNITION OF RETRO AND ULLAGE MOTORS ON SATURN V. /SAFE-815-1	JUL65	02167
LIQUID PROP INF AG	HYBRID-PROPULSION SYSTEMS -- HYBRID-PROPULSION SYSTEMS SYMPOSIUM, 4-5 OCTOBER 1961.	JAN62	00835
	JANAF-NASA-ARPA ROCKET FUELS SYNTHESIS SYMPOSIUM 26-27 SEPTEMBER 1961. SLIDES OF PRESENTATIONS. /METALS, BORON, NITROGEN, HYDRIDES		02570
LOCKHEED MIS+SPACE	SOME IDEAS CONCERNING RESONANT BURNING. /SAFE-565-3A	SEP58	02058
	ADVANCED LUNAR TRANSPORTATION STUDY FINAL REPORT -- VOLUME I. /SPACE-VEHICLES, REP-LMSC-8-09-63-1	JAN63	02373
	SUMMARY REPORT -- EARLY MANNED INTERPLANETARY MISSION STUDY SUMMARY REPORT -- VOLUME 2. /SPACE-VEHICLES, REP-LMSC-8-32-63-1	MAR63	02374
	NUCLEAR LUNAR LOGISTICS STUDY PRESENTATION 18 JULY 1963. /SPACE-VEHICLES, REP-LMSC-NSP-63-85	JUL63	02375
	NUCLEAR LUNAR LOGISTICS STUDY PRESENTATION 10 OCTOBER 1963. /SPACE-VEHICLES, REP-LMSC-NSP-63-114	OCT63	02376
	THERMONUCLEAR PROPULSION WITH DEUTERIUM-FUEL. /SAFE-RPC-537-4	SEP58	03708
	REVIEW AND PROGNOSIS FOR HEXANITROETHANE PROPELLANTS. /NITRONIUM-PERCHLORATE, HYBRID-PROPELLANTS, REP-LMSC-5-10-64-1	FEB64	04313
LOCKHEED-PROP	DEVELOPMENT OF AN ELASTOMERIC SEAL FOR OMNIAXIAL MOVABLE NOZZLES (LOCKSEAL) -- QUARTERLY REPORT NO. 1. /REP-LPC-589-Q-1, AFRPL-TR-65-108	MAY65	00836
	DEVELOPMENT OF AN ELASTOMERIC SEAL FOR OMNIAXIAL MOVABLE NOZZLES (LOCKSEAL) -- PROGRESS REPORT NO. 2. /REP-LPC-689-Q-2, AFRPL-TR-65-173	AUG65	00837
	EXPLORATORY DEVELOPMENT PROGRAM FOR A LIGHTWEIGHT SOLID ROCKET PULSE MOTOR, 6 NOV 1964 - 30 APR 1965. /REP-LPC-683-S-1, AFRPL-TR-65-115	MAY65	00838
	EXPLORATORY DEVELOPMENT PROGRAM FOR A LIGHTWEIGHT SOLID-ROCKET PULSE MOTOR, 1 MAY 1965 - 31 JULY 1965. /REP-LPC-683-Q-1, AFRPL-TR-65-165	AUG65	00839
	GRAIN DESIGN FOR HYBRID-MOTORS. /FUELS	JAN63	00840
	HYBRID-PROPULSION RESEARCH PROGRAM -- 1ST QUARTERLY REPORT. /LITHIUM-HYDRIDES, RUBBER, ALUMINUM	OCT62	00841
	HYBRID-PROPULSION RESEARCH PROGRAM -- 2ND QUARTERLY REPORT. /LITHIUM-HYDRIDES, RUBBER, ALUMINUM	JAN63	00842

FIGURE 12 - CORPORATE AUTHOR INDEX

KWOC INDEX PAGE 1

KEY WORD	TITLE	DATE	RETRIEVAL NUMBER
AF-04(611)-5686	ENCAPSULATION OF INGREDIENTS FOR USE IN SOLID-PROPELLANTS -- FINAL REPORT. /LITHIUM, ALUMINUM, HYDRIDE, NITRONIUM, PERCHLORATE	JUN61	04340
AF04(600)-7005/S58	DEVELOPMENT OF THE SPARK-HEATED, HYPERVELOCITY, BLOWDOWN TUNNEL - HOTSHOT. /WIND-TUNNELS	JUN58	00180
AF04(611)-10379	CHEMISTRY OF RARE GAS COMPOUNDS. /XENON, FLUORIDES		01639
AF04(611)-10381	GAS CHROMATOGRAPHIC METHODS FOR LIQUID-PROPELLANT ANALYSIS. /HYDRAZINE, NITROGEN, TETROXIDES, REP-OLIN-10381-2, AFRPL-TR-65-69	JUN65	01173
AF04(611)-10530	TESTING OF ADVANCED HIGH-ENERGY SOLID-PROPELLANTS. /BURNING-RATE, SAFETY, DIFLUORAMINO, STABILITY	NOV65	02725
AF04(611)-10531	FEASIBILITY DEMONSTRATION OF A LARGE IMPULSE SOLID-ROCKET ATTITUDE CONTROL MOTOR -- 1ST QUART TECH REP, REP-WAD-R-426-Q-1, AFRPL-TR-65-72	MAY65	01345
AF04(611)-10535	PERFORMANCE-CHARACTERISTICS OF A CRYOGENIC TRIPROPELLANT-SYSTEM -- QUARTERLY REPORT NO. 5. /BERYLLIUM, OXYGEN, HYDROGEN, AFRPL-TR-66-140	MAY66	04309
	PERFORMANCE CHARACTERISTICS OF A CRYOGENIC TRIPROPELLANT SYSTEM -- QUARTERLY REPORT NO. 4. /BERYLLIUM, HYDROGEN	MAR65	04318
AF04(611)-10537	DEVELOPMENT OF AN ELASTOMERIC SEAL FOR OMNIAXIAL MOVABLE NOZZLES (LOCKSEAL) -- QUARTERLY REPORT NO. 1. /REP-LPC-689-Q-1, AFRPL-TR-65-108	MAY65	00836
	DEVELOPMENT OF AN ELASTOMERIC SEAL FOR OMNIAXIAL MOVABLE NOZZLES (LOCKSEAL) -- PROGRESS REPORT NO. 2. /REP-LPC-689-Q-2, AFRPL-TR-65-173	AUG65	00837
AF04(611)-10538	HIGH-ENERGY OXIDIZER STABILIZATION STUDIES -- QUART REPT NO. 2. /NITRONIUM, PERCHLORATES, ADDITIVES, MERCURY	APR65	02562
	HIGH-ENERGY OXIDIZER STABILIZATION STUDIES -- QUART REPT NO. 3. /NITRONIUM, PERCHLORATES, ADDITIVES, GASSING	JUL65	02563
AF04(611)-10741	SOLID-PROPELLANT IGNITION STUDIES -- FINAL REPORT. /SAFE-565-28 AFRPL-TR-66-32	FEB66	02022
	SOLID-PROPELLANT IGNITION STUDIES -- 2ND QUARTERLY REPORT. /OXYGEN, IGNITION-DELAY, INFRARED, EMISSION-DETECTORS. /AFRPL-TR-65-197	OCT65	04240
AF04(611)-10751	A FEASIBILITY DEMONSTRATION OF A THERMAL-STRUCTURAL NOZZLE FOR SOLID-PROPELLANT ROCKET MOTORS -- 1ST QUARTERLY PROGRESS REPORT. /AFRPL-TR-65-179	AUG65	00364
AF04(611)-10787	DEVELOPMENT OF A HYPERSOLID IGNITION-SYSTEM. /STOP-START-MOTORS, DEKAZENE, POLYBUTADIENE, AFRPL-TR-66-212	AUG66	04239
AF04(611)-10788	HIGH PRESSURE CHEMISTRY OF HYDROGENOUS FUELS -- QUARTERLY PROGRESS REPORT 1 APRIL 1965 - 30 JUNE 1965. /AMMONIA, HYDROGEN		01168
AF04(611)-10789	EXPERIMENTAL INVESTIGATION OF PREPACKAGED HYBRID-PROPELLANT SYSTEMS -- 1ST QUARTERLY REPORT. /BORON, AMMONIUM, CHLORINE-PENTAFLUORIDE	AUG65	04472

FIGURE 13 - CONTRACT NUMBER INDEX

Typing and keypunch errors were detected and corrected during editing of the preliminary printouts.

(2) Cumulating

Eight printouts were issued during the year's indexing. Of these, three were cumulations. Each cumulation included all previous printouts and superseded them. The final cumulation represented 8280 documents, and totaled 4,191 pages as follows:

	Pages
Title Master List	6
Citation Index	903
KWOC Report	
Keyword Frequency List Section	64
No Key Error Section	0
Keyword Index	2503
Corporate Author Section	436
Contract Number Section	279

This final cumulation represents the book catalog of the AFRPL Library's document collection.

SECTION III

KWOC COMPUTER SYSTEM

1. BASIC HARDWARE AND SOFTWARE

The Lockheed KWOC (Keyword Out of Context) Computer System is a series of COBOL and utility programs designed to operate on the 32K IBM 7040/44 Computer utilizing the IBSYS operating system version 9 modification level 9. The system requires six work tapes, a system unit, a system input unit, and a system output unit. The IBSYS UPDATE and IBSYS SORT utilities are required. The computer system flow chart is shown in Figure 14.

2. INPUTS

The system utilizes three inputs: keypunch card file, exclusion word file, and a set of controls. The three inputs result from the indexing process. Throughout the system, documents are identified by a five-digit retrieval or accession number unique to each document. These numbers are assigned by the indexing staff.

a. Keypunch Card File

The keypunch card file is the first input. The file is prepared from the keypunch input sheets and contains all basic bibliographic information pertaining to the indexed documents. A maximum of four cards is required for each document. Each card represents a line on the keypunch input form. These lines are coded "T1" and "T2" for title and title enhancement information; "A" for author, date, pagination, number of references, and security classification information; and "R" for contract and report number information.

b. Exclusion Word File

The exclusion word file or suppressed word list is the second input. Since documents are computer-indexed by words found within the title, it is necessary to suppress indexing of the meaningless terms. One- and two-character words are automatically excluded as indexing terms or keywords. A keypunch card file, containing words of over two characters that are to be suppressed as keywords, has been developed. Documents will not be indexed by these terms even if they appear in the title.

c. Controls

A set of controls constitutes the third input. These controls govern the run number, range of acceptable retrieval numbers, and which of the available reports are to be produced. To establish these controls the indexer fills out KWOC Job Run Set Up Sheet shown in Figure 15.

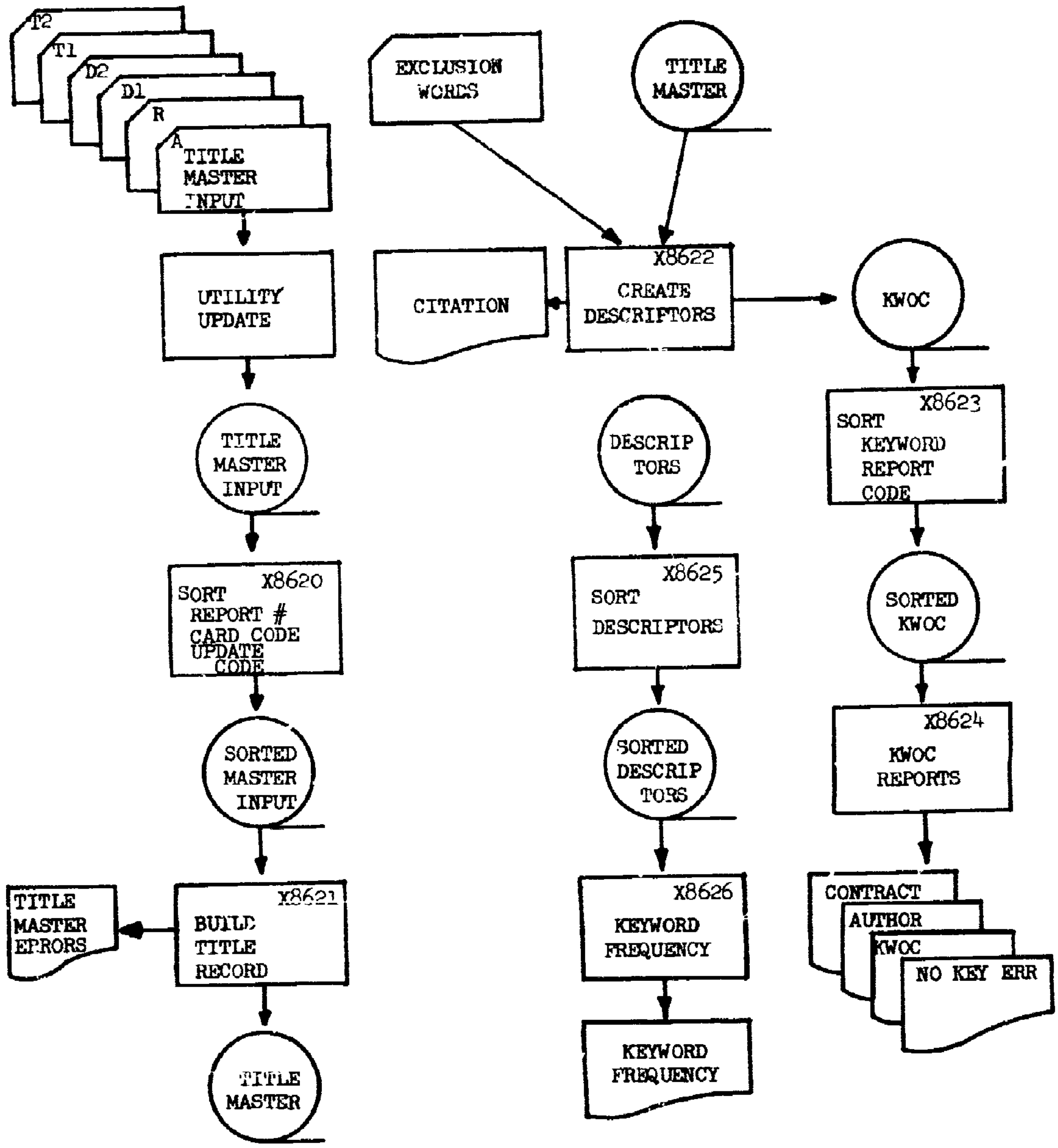


FIGURE 14 - AFRPL RAPID INDEXING COMPUTER SYSTEM

KWOC JOB RUN SET UP SHEET

TØ: ______________________ DATE: __________

BY: __________

RUN NUMBER |_|_| FIRST CARD INPUT __________ (INCLUDES

LAST CARD INPUT __________ TRANSMITTALS)

FIRST RETRIEVAL NUMBER |_|_|_|_|_|_|

LAST RETRIEVAL NUMBER |_|_|_|_|_|_|

KWØC REPØRT	YES	NØ 59	
AUTHØR REPØRT	YES	NØ 60	
CØNTRACT REPØRT	YES	NØ 61	
CITATIØN REPØRT	YES	NØ 62	
KEYWØRD REPØRT	YES	NØ 63	(JØBS X8625 (SØRT) AND X8626)
EXCLUSIØN WØRD FILE	YES	NØ 64	X8622 X-WDS DATA

THIS RUN WILL REQUIRE THE FØLLØWING INPUTS(S):

TRANSMITTALS YES NØ CARDS YES NØ (UTILITY UPDATE)

DATA TAPES: RUN ________	RUN ________		(SPECIFY TØTAL NUMBER
RUN ________	RUN ________		OF INPUTS ØN X8620
RUN ________	RUN ________		SØRT CØNTRØL CARDS
RUN ________	RUN ________		1 FØR FIRST LINE
RUN ________	RUN ________		AND 1 FØR EACH
RUN ________	RUN ________		RUN TØ BE INCLUDED.)

SAVE INPUT DATA YES NØ (SPECIFY UNLØAD OF X8620 SØRT INPUT AND RETENTIØN ØF TAPE(S).)

RETURN CARDS TØ LØCKHEED INDEXING YES NØ

NUMBER ØF CØPIES ØF REPØRT TØ BE PRINTED __________

NUMBER OF CØPIES TØ LØCKHEED INDEXING __________

DISTRIBUTIØN ØF ØTHER CØPIES: ______________________________

____

____

Figure 15 - KWOC Job Run Set-up Sheet

3. OUTPUTS

Four reports constitute the system's output. These are described in detail in SECTION II, part 3g. The first, the Title Master Report, is a list of errors detected during the audit of input data. A Citation Index, containing full bibliographic information pertaining to the documents, is the second report. Entries are in retrieval number sequence. A Keyword Frequency List of keywords extracted from the title, together with frequency of their occurrence, is the third report.

The fourth report is really a group of four stacked KWOC reports. Should a title contain only suppressed words, it would appear in the No Key Error section of these reports. Another section is the Keyword Index which presents keywords in alphabetic sequence. The next section, the Corporate Author Index, contains the documents keyed on corporate author in alphabetic sequence by author. The fourth section is a Contract Number Index.

4. PROGRAM DESCRIPTION

a. Utility Update

The IBSYS Utility UPDATE Program is one of several magnetic tape file formats for the 7040 IBSYS operating system. The program reads the title master data cards and builds a file of type 2 records for input to program X8620.

b. Program X8620

This program is an IBSYS Utility Sort. The major sort field is the retrieval number. The intermediate sort field is the card code (T1, T2, A, and R). The minor sort field is the change code. Controls are entered into the system via the LABEL control card of this file.

c. Program X8621

This program receives the sorted output from program X8620 and examines the change code to determine whether the current information is to be replaced, deleted, or remain. Records are listed on the Title Master error report if duplicate card codes are detected, a retrieval number contains no title information, or retrieval numbers within the range specified by the control cards are missing. A Title Master file is then created, having one record for each retrieval number that passes the audit.

d. Program X8622

This program reads the Title Master file produced by program X8621 and extracts the keywords from the title. A table is compiled from the exclusion words and used to suppress indexing of words appearing in the Exclusion Word file. Only the first occurrence of a term within a title

is indexed. This prevents a title from appearing twice under the same keyword. All words must be greater than two characters in length and start with an alphabetic character to be indexed. Words shorter than three characters or preceded by numerals are not indexed. If no keywords are found in the title, a record is created for the KWOC No Key Error report.

A descriptor file record is produced for each valid keyword to be processed on program X8625. The retrieval number is included if the word is over 18 characters long. Each retrieval number generates one record for each keyword, one by corporate author, and one by contract number for the three KWOC reports. An entry is also made in the Citation Index report for each retrieval number. The entry contains the retrieval number, 144 characters of title, corporate author, personal author, ET AL if required to indicate additional personal authors, contract number, report number, the Defense Documentation Center's AD number, date, number of pages, number of references, and the security code.

e. Program X8625

This IGSYS Utility Sort program sorts the descriptor file from program X8622 on keyword major and retrieval number minor. By this method titles are arranged in retrieval number order under each keyword.

f. Program X8626

This program reads the sorted output file from program X8625 and accumulates the number of occurrences of each keyword not over 18 characters long. A Keyword Frequency report is produced with 150 keywords and their frequency of occurrence on each page. Keywords of over 18 characters are also listed. They are repeated as often as they occurred and the retrieval number of each is given.

g. Program X8623

This IBSYS Utility Sort program reads the records for the four sections of the KWOC report that were produced in X8622. The major sort key is the report code, intermediate sort is the keyword, and minor sort key is the retrieval number.

h. Program X8624

This COBOL program builds the KWOC reports from the sorted output of X8623.

There are four acceptable report codes:

E - No Key Error report

K - Keyword report

U - Corporate Author report

Z - Contract Number report.

The Keyword report starts a new page whenever the first letter of the keyword changes. A duplicate keyword is not repeated on the same page. A duplicate keyword is repeated only on the first line of each successive page. All of these reports (Keyword, Corporate Author, and Contract Number) contain the indexed item. Each indexed item includes full title, issuing date, and retrieval number.

5. DESCRIPTORS

Provision has been made in the computer program for two lines of descriptors. These are shown as keypunch cards "D1" and "D2" of the flow chart, Figure 14.

6. DETAILED FLOW CHARTS

The complete set of flow charts, which have been turned over to the Air Force, are not repeated in this report. While they are required for operation of the Rapid Indexing System, these charts are not necessary for an understanding of overall program logic.

SECTION IV

STATUS AT CLOSE OF PROGRAM

On-site indexing terminated June 27, 1967. As of that date, the basic collection had been cleared of duplicate copies of documents. The remaining documents were indexed and shelved in the AFRPL Library.

1. DOCUMENTS INDEXED

A total of 8,280 documents were fully indexed; that is, preliminary printouts were obtained, edited, and corrected. The final five-copy run was obtained and distributed. Of these documents, (3,311 or 40%) were unclassified, 4,625 (or 55.9%) were confidential, and 344 (or 4.1%) were secret.

Since indexing continued through the last day of the contract, an additional 558 documents were indexed. Of these, 331 were from the Chemical Laboratory and 227 from other sources. Therefore, a total of 8,838 documents were indexed. However, preliminary printouts of the final 558 documents were not received in time for editing.

2. BACKLOG

At the initial survey, completed in August 1965, it was estimated that approximately 8,000 documents were available for indexing (Reference 1). It was also estimated that the number of documents increased by about 4,600 per year. Duplication was placed at between 30% and 35% or about one-third. Therefore, at the start of indexing in July 1966, 12,600 documents were available. Of these, one-third or 4,200 should have been duplicate copies, leaving 8,400 for indexing. This estimate proved fairly accurate.

During the course of indexing, AFRPL personnel acquired additional documents at a rate of approximately 90 to 95 per week. Estimate at close of contract placed unindexed documents at 5,000. Of these, approximately 3,500 are available for recall and indexing. These documents are distributed as follows:

AFRPL Library	3,000 documents
Chemical Laboratory	250
AFFTC Technical Library	250

The remaining 1,500 documents are in individual collections and not available for recall.

Experience with duplicate copies indicates that of the 3,500 unindexed documents 2,350 remain to be indexed. If rate of acquisition remains constant (90 to 95 documents per week), and duplicate copies continue to be discarded, documents to be indexed will increase at a rate of 65 documents per week or 845 per quarter.

Should indexing remain suspended until September 1967, there will be a backlog of 3,195 documents at start of the new program. Approximately 3,380 will be added for indexing during the year for a total of 6,575 documents. An active program to select and acquire additional reports of special importance to AFRPL would increase this figure by 2,800 documents for a possible total of 9,375 documents to be indexed.

Effects of a Selective Dissemination of Information(SDI) program and the possible need to retain duplicate copies of current documents have not been considered in these calculations.

3. BOOK CATALOG

The 8,280 document computer printout required a total of 4,191 pages. Of these, the Title Master List was 6 pages long and the Keyword Frequency List ran to 64 pages. The remaining 4,121 pages constitute the AFRPL Library's document book catalog which stacks 15-3/8 inches high. While admittedly an unwieldy mass of paper, it divides into convenient, easily handled volumes.

Through vocabulary maniuplation during the indexing phase, two additional indexes, undetectable by the computer, were created. This permitted their production without additional computer programming, but left them embedded in the Keyword Index. They consisted of a Report Number Index and a Document Location Index. These indexes were removed from the Keyword Index and collected into separate volumes of the book catalog.

The various indexes of the book catalog therefore consist of the following:

- Citation Index
- Corporate Author Index
- Contract Number Index
- Report Number Index
- Document Location Index
- Keyword Index.

A trial use of the book catalog indicated that volumes of 580 to 600 pages ($2\frac{1}{4}$ to $2\frac{1}{2}$ inches thick) were the largest easily handled divisions. Consequently the book catalog was divided into eight volumes. This provided the additional advantage of enabling a number of people to use the catalog simultaneously.

a. Citation Index

The Citation Index or accession list, which ran to 903 pages, was divided roughly in half and bound into two volumes:

Vol. I - Retrieval Numbers 1 to 4005 (pages 1 - 436)

Vol. II - Retrieval Numbers 4006 to 8280 (pages 437 - 903).

b. Corporate Author Index

The Corporate Author Index, which ran to only 438 pages, was bound into a single volume.

c. Contract, Report Number, and Document Location Indexes

These three indexes are somewhat related, and were combined into a single volume of 437 pages. Each index is a section and is marked by a tab label separator.

(1) Contract Number Index

The Contract Number Index is the first section because of its great importance. The section consists of 279 pages.

(2) Report Number Index

This section of 60 pages was removed from two different alpha-numeric positions in the Keyword Index. The Air Force Flight Test Center (AFFTC) and Air Force Rocket Propulsion Laboratory (AFRPL) reports stand out and appear directly under their straight alpha-numeric designation (pages 36 to 55 of the printout).

All other report numbers were preceded by the code REP and appear on pages 1812 to 1851 of the Keyword Index. Within the REP designation, they are in alpha-numeric sequence.

(3) Document Location Index

Since the AFRPL Library vault was not completed until March 31, 1967, many documents were returned to the various safes after indexing. By issuing the Document Location Index as part of each printout, it was possible to locate these documents until they could be shelved in the library vault.

When the vault became available, the Librarian was able to schedule recall of documents in shelving order. Use of this index will phase out after all documents have been recalled and accommodated in the vault.

d. Keyword Index

The equivalent of a library's subject catalog, the Keyword Index, the largest (2503 pages) and the most used of the various indexes, provides the user with a list of all documents on his subject interest in a given collection. With all other indexes, the user must start with a specific

piece of information such as an author, contract number, or report number. The Keyword Index requires no such prior knowledge.

Division of indexes into four volumes proved most effective from the point of view of size, user convenience, and ability to accommodate peak loads. The volumes of the Keyword Index were divided as follows:

Vol. I - A to D (pages 1 to 583)

Vol. II - E to L (pages 584 to 1189)

Vol. III - M to Q (pages 1190 to 1751)

Vol. IV - R to Z (pages 1752 to 2503).

4. ACCOMPLISHMENTS

During the course of work, the keyword indexes were improved by controlled vocabulary, further defining indexing rules, and creating additional indexes. The Corporate Author List was expanded, rules were formalized, and cross references were added.

These improvements kept printouts within manageable size, decreased the number of suppressed words, decreased computer time, and made printouts easier to use.

a. Keyword Index

The Keyword Index, being the largest and most frequently used of the four basic indexes, provided maximum results from each improvement. Greatest effort was therefore concentrated in this area.

(1) Exclusion Word File

A KWOC system is based upon automatic indexing by keywords contained in a document's title. Since some words in a title are not useful keywords, the computer requires a stored list of words that it will suppress as indexing terms.

The computer must match every word in every document title against every word in the Exclusion Word File. Therefore, a decrease in the number of terms on a suppressed word list causes a decrease in computer processing time.

Though the easiest way to suppress a meaningless term is to add it to the suppressed word list, other methods were developed. Most of these methods tended toward a controlled vocabulary which held down the size of the suppressed word list.

(a) One- and Two Character Terms

As a start in decreasing terms on the suppressed word list, all one- and two-character terms were automatically excluded as keywords. In addition to the usual terms in this category, many Roman numerals were automatically excluded.

The computer program itself does not recognize Arabic numerals as keywords unless they are preceded by letters of the alphabet.

These factors paved the way for a further decrease in the exclusion word file.

(b) Hyphenations

A number of terms were removed from the suppressed word list as indexing terms by the mere expedient of removing hyphens. PART-1, PART-2, etc. are used fairly consistently in document titles. Originally it had been necessary to suppress each of these through PART-15. These 15 suppressed terms were reduced to one by suppressing PART and removing the hyphen in the title.

Similarly, progress report numbers appear in titles as PROGRESS REPORT 1 and PR-1. These ran as high as PR-43. By changing these terms to PR 1, PR 2, etc. in the titles, they automatically dropped out as keywords without requiring any suppressed terms.

SEMI-ANNUAL, SEMI-MONTHLY, SEMI-QUARTERLY, SEMIANNUAL, etc. are also common forms used in titles. Each variation had to be suppressed as well as the terms ANNUAL, MONTHLY, etc. This was cleaned up by suppressing the prefix SEMI. Then, in the indexing process a space was always left between the prefix SEMI and whatever followed.

(c) Ordinal Numerals

Many reports and proceedings in the AFRPL document collection contain ordinal numerals (FIRST, SECOND, etc.) in the title. These terms were removed from the suppressed word list by changing them to 1ST, 2ND, etc. in the document titles.

(2) Keywords

Every term in a document's title, not suppressed by the exclusion word file, indexes as a keyword. A keyword is a combination of letters and numbers between two blank spaces, provided the keyword does not begin with an Arabic number. Arabic numbers, not preceded by at least a single letter, are read by the computer as blank spaces and do not index.

The more keywords in a title, the greater the number of indexing points and correspondingly the longer the Keyword Index. Further, the larger the number of keywords, the less information conveyed by each and the greater the number of entries gathered under each term.

To hold down the length of the Keyword Index and to make each keyword more meaningful (specific), as many terms as possible were combined into single keywords by hyphenating. Much of the combining of terms was accomplished during initial indexing. Editing of preliminary printouts provided further opportunity for developing the best possible index under a KWOC system.

(3) Thesaurus

As indexing progressed, it became apparent that a controlled vocabulary was desirable. The combination of terms formed into keywords appeared on the Keyword Frequency List received with each set of printouts. Each Keyword Frequency List then served as a thesaurus for indexing the next batch of documents. This provided for consistency in combining terms and resulted in indexing by a partially controlled vocabulary.

The final cumulated printout for the 8,280 indexed documents produced a Keyword Frequency List containing every keyword occurring in these documents. A sample of the list is shown in Figure 7. This final list has been compiled into a thesaurus through editing and providing cross references. The completed thesaurus appears as SECTION III of the Appendix.

b. Other Indexes

As work on the Rapid Indexing System got under way, the AFRPL STINFO Office recognized additional possibilities of the system and became aware of the duplicate document problem and document storage requirements.

Use of the early printouts indicated that a report number printout, particularly for the AFRPL reports, would be desirable. To avoid indexing duplicate copies of documents, a report number/retrieval number cross index was necessary. This was developed manually on 3 x 5 cards. Storage of indexed documents in various offices raised the need for a document location index.

The above indexes were provided without recourse to computer program changes.

c. Corporate Author Authority List

Prior to the start of on-site indexing, a preliminary Corporate Author Authority List was produced. It was based upon the Chemical Propulsion Information Agency's "Chemical Propulsion Abstract" source index. Rules for continuing the list were also formulated at that time.

As indexing progressed, it was noticed that every 100 documents generated 5 new corporate authors. Of these, some resulted from name changes, others came about through company mergers, and some were caused by the forming of new divisions or regrouping of existing divisions.

Changes in company names split the grouping of documents by corporate author. This is particularly a problem when a name change occurs in the middle of a series of reports. To overcome this problem, the Corporate Author Authority List, appearing as SECTION II of the Appendix, is completely cross referenced.

SECTION V

SYSTEM EVALUATION

The Rapid Indexing System was intended as a quick and simple method to gain bibliographic control over approximately 8,000 documents. The system has accomplished its purpose.

In addition, this title-based indexing system has provided the basis for a more sophisticated system, indicated desirable features to be considered in a future system, and provided several usable by-products.

The overall system is critically evaluated in this section from the point of view of what it was designed to accomplish.

1. INDEXING

There were 47 weeks available for indexing after the first five weeks of the contract were given over to preparation of test runs for Air Force approval and setting up on-site indexing facilities and procedures.

Based upon 47 weeks of active indexing and a goal of 8,000 documents, a quota of 37 documents per day was established. Considering holidays, this was translated into a mean of 170 documents per week. This allowed for a contingency to cover unforeseen delays and to handle overhead activities related to the overall indexing process. The indexing quota was for tracking purposes only and bore no relationship to minutes per document.

On a weekly basis the total varied widely from a low of 66 to a high of 303. However, monthly quantity of documents indexed ran consistently ahead of schedule. This insured meeting the 8,000 document goal.

a. Indexing Rate

Actual indexing consisted in (1) checking for duplicate documents, (2) making a report number/retrieval number index card, (3) determining complete bibliographic information, (4) coding this information on the document's title page, (5) assigning the retrieval number, and (6) typing the keypunch input form.

It is estimated that these activities averaged 20.7 minutes per document. Classified documents represented 60% of the collection and required 23.75 minutes per document. Unclassified documents required 15.8 minutes of indexing time per document. The originally estimated average indexing time for KWOC plus descriptive cataloging was set at 30 minutes per document (Reference 1, Page 36 and 42). Improved indexing procedures, experience gained as work progressed, and growing familiarity with the keypunch input form contributed to cutting the indexing time by 31%.

b. Error Rate

Typing errors averaged 3.5% or one error out of every 28 documents indexed.

Keypunch errors varied from nearly perfect to a few high error groupings, but averaged out at 1.5% or one error for every 67 documents keypunched.

2. PRINTOUTS

Actual indexing of individual documents required 84.5% of the on-site indexing staff's time. The remaining 15.5% of available manhours was devoted largely to print-out improvement.

a. Keyword Index

Each document title, if left in its title page form, would have produced an average of 9 permutations. Therefore the 8,280 titles would have yielded 74,520 entries. At 18 entries per printout page this would have produced 4,140 pages.

Through improved indexing methods, grouping of terms by hyphenation, and a carefully selected suppressed word list, the Keyword Index was cut 39.5%. The index ran a total of 2,503 pages, averaging 5.5 permutations per per title. This reduction in permutations per title was effected in spite of the addition of title enhancement terms including report numbers and location codes.

This resulted in:

- A saving in computer time
- A better keyword index with fewer and more specific descriptors
- Two additional indexes (report number and document location indexes).

b. Additional Indexes

(1) A Report Number/Retrieval Number card index was produced as a necessary tool in manually detecting duplicate copies of a document prior to indexing. This card file proved to be a useful index and has therefore been transferred to the AFRPL Library's card catalog.

(2) A report Number Index was developed through keyword manipulation rather than by resorting to computer program alteration. It picks up both issuing agency and originating agency report numbers, giving full title, date, and retrieval number for each.

(3) A Document Location Index was created without computer program change. This index became necessary when many documents were returned to their original location after indexing. Its use will phase out when all documents have been shelved in the central location.

3. SYSTEM SHORTCOMINGS

In a title-based system, most shortcomings stem from the title. The prime problem lies in the fact that title word order often prevents joining terms into meaningful keywords by hyphenation. A second difficulty arises from reversal of words and their separation by prepositions. Use of different terms for the same object or process causes the final problem.

This title-based system was adopted as a quick means of indexing the AFRPL collection of over 8,000 documents. Its shortcomings were recognized but it was considered to be the most practical means of meeting the requirement. The program developed had, however, the potential of full convertibility to indexing by use of controlled vocabulary which was envisioned as the best means of handling current documents.

Many of these difficulties could be handled through title enhancement. However, to hold down computer time and keep the printout within manageable size, title and title enhancement terms were limited to two lines of 72 characters each.

The 144 character limitation was adopted after an actual count of representative titles. After indexing over 12,000 documents at Lockheed and over 8,000 at AFRPL, the space allotted for titles has proven adequate. With few exceptions, there was also room for title enhancement terms. However, the number of enhancement terms that can be accommodated is limited. Unfortunately the longer titles frequently contained all three types of indexing problems and left inadequate space for their correction.

a. Title Alteration

In the Rapid Indexing System, the title in the Citation Index appears exactly as in the various parts of the KWOC Index. In a bibliographic sense, the citation should be a true reflection of the document it represents. Yet several types of manipulations were performed on the title to overcome the above mentioned problems.

Every attempt was made to keep each title essentially intact and still produce a useful keyword index.

Types of changes made to titles included hyphenation, substitution of cardinal for ordinal numerals, and reversal of models and their numbers.

Some desirable changes were too radical and therefore considered impractical.

(1) Hyphenations

Hyphens were inserted between words in a title to form more specific keywords. For example the word SOLID was consistently joined to PROPELLANT.

Hyphens were removed from words in a title when their presence formed misleading terms. The incorrect keyword PERCHLORATE-POTASSIUM would result from the chemical system BARIUM PERCHLORATE-POTASSIUM NITRATE. To correct this for the index, that portion of the title was altered to read BARIUM-PERCHLORATE/POTASSIUM-NITRATE.

(2) Numbers

All ordinal numerals were changed to cardinal numerals, FIRST, SECOND, etc. became 1ST, 2ND, etc. This change in the title automatically suppressed numbers as keywords.

(3) Reversal of Terms

Most reversal of terms were considered too radical a title alteration. Engine and motor designations, however, were reversed in the title for indexing purposes. Frequently such designations appeared as 2060-SL MOTOR. To keep the numerical portion from dropping out of the keyword it was necessary to change this portion of the title to read MOTOR-2060-SL.

(4) Impractical Title Change

One particular title change, having a high frequency of occurrence, was deemed too great an alteration. It was therefore left intact and many important keywords were thus lost. This is the type in which the terms are both in reversed order for keywords and separated by a preposition. Examples of such terms are RECOVERY OF URANIUM and RATE OF BURNING. Natural keywords for these topics would be URANIUM-RECOVERY and BURNING-RATE.

b. Uncontrolled Vocabulary

Two problems are caused by an uncontrolled vocabulary in addition to those requiring changes in document titles. Documents on the same subject are often divided under two different keywords because of synonyms. Computer time is increased by the need to match every word in the title against the Exclusion Word File.

(1) Synonyms

HIGH-ENERGY-FUEL and HEF, BURNING-RATE and COMBUSTION-RATE, SOLID-FUEL and SOLID-PROPELLANT, and many other synonyms, or near synonyms, have

been used interchangeably in various titles. It is possible to add the synonym as a title enhancement term. However, the 144 character title limitation may prevent this. Also it would cause the documents to appear under both synonyms, thus greatly increasing the size of the Keyword Index.

Appearance of the documents under both synonyms could be prevented by selecting one as the keyword and suppressing the other. This method increases the size of the suppressed word list and therefore increases computer time. It also increases indexing time because each word must be looked up in a Thesaurus. The user may not find the keyword because no provision has been made for cross references.

(2) Variant Spellings

The same difficulties caused by synonyms are encountered in the use of variant spellings. For example DEUTEROPENTABORANE and DEUTERIOPENTABORANE.

(3) Exclusion Word File

Use of an uncontrolled vocabulary derived from the words in a document's title necessitated suppression of terms having no information content. This practice (1) increased computer time in the word for word matching process, (2) permitted a fair number of "noise words" to appear in the Keyword Index since the suppressed word list had to be kept as short as possible and could not accommodate terms occurring only a few times, and (3) made word manipulation necessary, thereby increasing indexing time and further altering document titles.

c. Keypunching

Input for the Rapid Indexing System goes from title page coding to typing of keypunch input sheets to keypunching to computer processing. Of the four steps, it is possible to eliminate keypunching in view of recent developments in optical scanning.

While keypunch error is low (1.5%), it does produce errors. Keypunching is also expensive, can cause delays, and is not within the direct control of the indexer.

These system shortcomings can be overcome through the methods recommended in SECTION VI. In spite of the shortcomings that have been noted, the system was an effective solution to the task for which it was designed. However, a more sophisticated system is needed for the second phase of AFRPL's information retrieval program.

SECTION VI

SYSTEM RECOMMENDATIONS

A more advanced and complete system is recommended for the second phase of AFRPL's information program. Such a system would consist of (1) indexing by controlled vocabulary - an innovation that extends the system's capabilities in several ways, (2) an active selection and acquisition program, (3) literature searching, and (4) a program for encouraging use of the information services and facilities.

The Rapid Indexing System, devised and implemented during the initial phase, leads logically into the advanced system. The recommended system overcomes the earlier system's shortcomings which have been analyzed in SECTION V. This new system does not displace the initial system but rather supplements it and uses the earlier system's by-products.

These recommendations are based upon findings of the AFRPL information facility survey (Reference 1), experience gained during the initial indexing program, Lockheed's increased information retrieval developments, and some recent developments, and some recent developments in government information storage and retrieval.

1. CONTROLLED VOCABULARY

Use of a controlled vocabulary will (1) increase keyword specificity without title alteration, (2) decrease computer time, (3) provide a descriptor-type abstract as part of each citation, and (4) provide for a form of Selective Dissemination of Information (SDI).

The initial computer program required a maximum of four keypunch cards per document. Of these, "T1" and "T2" provided title information, "A" contained author and bibliographic information, and "R" carried contract and report number information. Keywords were automatically produced from the title card information. A suppressed word list was required to suppress unwanted words in the title from indexing as keywords.

In the controlled vocabulary system, a maximum of six keypunch cards are required. These consist of the four cards defined above and cards "D1" and "D2" for descriptors. Cards "T1" and "T2" continue to contain title information but no longer provide keywords for indexing. Cards "D1" and "D2" provide a total of 144 characters for descriptors selected by the indexer from the thesaurus. These descriptors are the keywords by which the document is indexed. Since only desired terms are entered here, there are no terms to suppress. Need for a suppressed word list and title changes has been eliminated.

a. Keyword Specificity

The initial system tended toward a controlled vocabulary in order to produce an index with keywords of specific meaning and narrow scope. This was of limited success since the necessary control over vocabulary is not the function of a title-based system nor within its capability. Therefore documents were divided under several keywords of similar meaning and too many entries appeared under keywords of broad scope.

Efforts to exert control over the initial system's vocabulary centered on manipulation of words in the title and use of title enhancement terms. Results were reflected in the Keyword Frequency List obtained with each computer run. Considerable but not complete keyword consistency was achieved through use of the previous printout's Keyword Frequency List as a guide in subsequent indexing.

The final cumulated list provided the basis for a thesaurus.

(1) Thesaurus

A thesaurus was produced from the final Keyword Frequency List by (1) removing "noise words", (2) adding cross references from general to specific terms and among related terms, and (3) standardizing vocabulary.

The Keyword Frequency List is an aid to the user of the Keyword Index in that it enables him to determine the keywords under which he will find documents on a desired subject. The thesaurus provides the same retrieval function for users of the controlled vocabulary printouts. However, it will be necessary to develop the thesaurus into a detailed dictionary to meet AFRPL's requirements for a very fine subject breakdown in the propulsion area.

(2) Dictionary

The thesaurus merely provides basic vocabulary for the start of controlled vocabulary indexing. A dictionary of AFRPL indexing terms will be required for continuation of indexing and as a retrieval tool at close of the second year's program. During the duration of the program the dictionary will require constant revision, additions, and defining of terms and scope of terms.

Available thesauruses are too general for AFRPL use. Definitions of terms and their scope also are not sufficiently specific. It is highly unlikely that future thesauruses can provide the fine degree of subject breakdown in the propulsion area required by AFRPL personnel. It is therefore necessary to develop the required dictionary during the course of any future indexing effort and to issue a completed dictionary at the end of the next phase of the program.

b. Computer time

The controlled vocabulary system decreases computer time in two major areas: (1) Exclusion Word File matching, and (2) shorter Keyword Index.

(1) Exclusion Word File

Under the title-based system, every word in each of the 8,280 document titles had to be matched against the 860 words in the Exclusion Word File. This computer process will be eliminated in indexing by controlled vocabulary.

(2) Keyword Index

In the initial indexing system, useless terms appeared in the Keyword Index because it was impossible to suppress every word which gathered only one or two titles. Similarly some terms that were too broad in scope could not be suppressed without greatly altering the titles concerned. A few of these produced as many as 400 entries running to over 20 pages of printout.

In the controlled vocabulary system the indexer will select only the useful terms. Terms that needlessly lengthen the Keyword Index will be discarded, thereby decreasing computer time.

c. Abstracts

In the AFRPL information facility survey, 4.2% of personnel desired abstracts to overcome the problem of misleading titles (Reference 1, Pages 9 and 11). Abstracting is both costly and time consuming to produce. It is therefore not recommended even though desirable.

The recommended indexing system will include two additional lines on which descriptors selected by the indexer are entered. These descriptors will print out on the Citation Index below the bibliographic description of each entry. They constitute a clear description of the subject content of the document concerned. As such they provide much of the information contained in abstracts without the cost of abstracting.

d. Selective Dissemination of Information (SDI)

A controlled vocabulary indexing system makes Selective Dissemination of Information possible. The same thesaurus or dictionary employed in indexing documents is used for establishing personal and unit profiles for SDI.

An active selection and acquisitions program coupled with SDI is a very effective means of keeping personnel abreast of the latest documents in his field. The SDI notice, sent out the day a new document is indexed, represents a document the individual can obtain immediately. This is similar in nature to NASA's SCAN program now under development and in which Lockheed is considering participation.

2. SELECTION, ACQUISITION, AND STORAGE

A collection should contain material completely processed and ready for loan before it is required. This calls for an active selection and acquisitions program.

a. Selection and Acquisition

To provide a document collection of the latest reports available in the propulsion field and avoid delays in furnishing requested documents to AFRPL personnel, an active selection and acquisition program is recommended as part of the advanced information system. It has been estimated that such a program would increase the AFRPL document collection by approximately 2800 items annually (Reference 1, Page 41).

b. Storage

An increase in the document collection will create a storage problem because shelving space in the AFRPL library and adjacent vault is limited. The storage problem can be kept under control through weeding the hard-copy collection, use of microfiche, and increased circulation of documents.

(1) Weeding

The KWOC printouts afford an easy method for selecting documents to be discarded. Each entry yields the document title, date, and retrieval number. Older documents and documents covering topics no longer of interest to AFRPL personnel can be discovered without difficulty.

Removal of discarded documents from future printouts is accomplished quite simply. A list of discarded retrieval numbers is submitted to the indexer. The indexer then has each retrieval number, followed by the code "X" entered on the keypunch input forms. This information when keypunched and put through computer processing removes all entries for the documents concerned from the subsequent printout.

(2) Microfiche

Microfiche is starting to replace hard copy as the lowest priced and quickest form of printing. Several books have already been published simultaneously in hardbound and microfiche form. Microfiche is low in cost, durable, easy to file, requires little space, and is easy to use.

Consideration of an AFRPL microfiche collection is recommended as a possible answer to the storage problem and for future advanced systems.

SDD (Selective Dissemination of Documents) is beginning to replace SDI. In SDD, a microfiche copy of the document is distributed with the

notice in place of an abstract. Eventually, each individual has that portion of the document collection of interest to him in his own desk drawer. Low cost (under $100) portable readers enable him to read the documents. The automated retrieval system is used to indicate which microfiche in his file will be required for a specific problem.

3. LITERATURE SEARCH

A complete literature search service covering AFRPL's document collection, the full scope of report literature, and English and foreign language publications is recommended as part of the advanced information system. Literature searches are required to enable AFRPL personnel to (1) solve specific technical problems, (2) prevent duplication of effort, (3) keep abreast of their field, (4) utilize basic research results, and (5) define work of contractors.

Each search should be clearly defined in dialogue between the scientist and trained literature searcher. Facilities used in a search should include (1) AFRPL's collection, (2) Defense Documentation Center's services, (3) specialized government information centers, including NASA, (4) the contractor's information services, and (5) the collections of college and university libraries.

The search topic and requester's needs should determine the form of the output. For a very specific search yielding only a few references, the actual items could be delivered to the requester. In other cases, a list of citations may suffice, or a fully annotated, subject indexed bibliography may be required.

Not all search results are of lasting value or of general interest. Worthwhile results should be entered into the indexing system and become part of the document collection.

4. ENCOURAGING USE OF SYSTEM

The recommended information system is directly related to the needs of AFRPL personnel and is based upon sound information retrieval principles. However, it is of no value unless used by the personnel concerned. In fact, the greater the use of the system the lower the cost per use. A continual program for encouraging use of the information services and facilities is an integral part of the recommended system.

Such a program includes (1) library bulletin, (2) handbook of information services, and (3) on-site information retrieval courses.

a. Library Bulletin

This consists of an accession list produced as part of the computer program, a form for requesting the listed items, and any special announcements concerning the library and its services.

b. Handbook

A library handbook should be written, reproduced, and distributed to all library users. It need not be elaborate but it should clearly describe all available services, procedure for obtaining these services, and location of the various collections.

c. Information Retrieval Courses

During the original survey of AFRPL personnel, it was discovered that few were aware of the extent of information services available to them and how to use these services. In a library questionnaire distributed by the AFRPL Library Advisory Committee in August of 1965, only 44 out of 101 respondents were acquainted with the Defense Documentation Center's Technical Abstract Bulletin. This situation is not limited to AFRPL.

Information scientists are receiving formal education, indexers are participating in on-the-job training programs, but the ultimate information user is largely neglected. As a result, the products of advances in the information sciences are little used by the very people for whom they were created. This is a nation-wide problem.

A series of information retrieval courses at the Lockheed-California Company was received with enthusiasm and led directly to increased and more intelligent use of the Company's information services and government sponsored services (Reference 2). A short summary session on information techniques, presented to AFRPL personnel in August of 1965, met with interest and success.

An on-site information retrieval course for interested AFRPL personnel is recommended as part of a complete advanced information system. Such a course would be patterned after the curriculum outlined in Reference 2 but slanted directly toward AFRPL needs.

SECTION VII

FACILITY AND EQUIPMENT RECOMMENDATIONS

To maintain effectiveness of the initial indexing effort and provide for the overall information program recommended in SECTION VI, adequate facilities and equipment are essential. Most, if not all, of the required equipment is available at AFRPL.

Facilities and equipment required by the indexing and literature search staff are determined by size of staff and types of activities. Functions and procedures are sufficiently established to recommend accurate area and equipment requirements.

The recommended indexing system is independent of the computer equipment on which it is run. It will function with on-site computer equipment as well as with recently developed hardware. Therefore, the more advanced equipment is presented for consideration.

1. INDEXING SITE

a. Location

The indexing site should be so located as to afford ease of accessibility to the library. This is important for effective utilization of the reference materials, which include the report number/accession number card file used by the indexer in checking for duplicate reports. Accessibility to the library is also important for the literature search program and for coordination activities with the Air Force program monitor and the AFRPL project manager. Vault space is essential in that 60% of the reports for indexing are classified. The library can meet this need.

b. Size

To accommodate a staff of three, needed to carry out the recommendations made in the previous section together with necessary equipment, would require approximately 400 square feet of unobstructed floor space. This would permit arrangement of equipment for efficient flow of work and provide for the storage of unclassified documents awaiting processing and disposition.

2. COMPUTER EQUIPMENT

a. On-site Equipment

A future step in developing a retrieval system, although not recommended for the upcoming phase, would be to provide the user with a remote terminal

for direct inquiry into the data file. The search strategy would be formulated by the user and input by means of the terminal. The response would be immediate and would be output at the terminal.

A system of this type would require direct-access computer equipment with provision for a mass storage. All of the major computer manufacturers offer this type of equipment. Some of the common types of remote terminals are teletype, typewriter keyboard-printer, and visual display. The mass storage medias offered are drum, disc and magnetic strip.

An important consideration in selecting the computer manufacturer and equipment is the quality of software provided by the manufacturer. Terminal response time will be greatly influenced by the terminal type and the mass storage device selected. The system response time will be inversely proportional to the cost and the system will be a compromise between cost and utility.

Microfiche reader/printers (two reader-printers and two readers) would be required if the active acquisition/SDD program were initiated.

No additional on-site equipment requirements are foreseen for the coming phase of the program.

b. Contractual Equipment

The transcription of source data is a major consideration in any data processing system. There are several techniques available for recording data into machine sensible form. One of the more promising is optical scanning. In this case the data are typed and then read and recorded on magnetic tape by an optical page reader. Several service bureaus in the Los Angeles area sell optical scanning time on the Control Data Corp., 915 optical page reader.

Optical scanning has the advantage of using a typist to record for source recording rather than a keypunch operator as in the case with the standard keypunch or recording on off-line magnetic tape. Work is also being done in direct data input to a computer from a remote terminal, but this is still a costly method.

3. EQUIPMENT INDEXING

a. Office Furniture

Office furnishing requirements are basic and can be met with standard Air Force issue and are as follows:

2 ea. Metal Executive Desks
1 ea. Metal Typist Desk
2 ea. Executive-type Desk Chair
1 ea. Typist Chair
4 ea. Tables (30-in. x 60-in.)
4 ea. Side Chairs
2 ea. Two Sectional Book Cases
1 ea. 5-Drawer File Cabinet
1 ea. Security Cabinet
4 ea. Waste Receptacles
3 ea. Letter Files (3-tier type).

The equipment listed will meet the needs of a three-man effort. The file cabinet requirement will vary depending on actual location of the indexing unit. If the microfiche program is adopted, a microfiche filing cabinet will be needed in the library.

b. Reference Books

Reference books are essential for the indexing operation. If recommendation for location of the indexing unit near the library is followed, book requirements will be met. In the event this is not feasible, a small reference collection to meet the needs of the indexer would have to be established at the indexing site.

SECTION VIII

SUMMARY AND CONCLUSIONS

A basic KWOC system was selected as the quickest method to gain effective control over scattered, unindexed documents numbering over 3,000. Shortcomings inherent in a title-based system were minimized through computer programming, indexing techniques, and editing consistency into the preliminary printouts.

Accomplishments during the contract period included:

- Maintaining a low error rate
- Decreasing computer time
- Improving indexing methods
- Providing better indexes
- Creating additional indexes.

Overall result was a system that accomplished the task for which it was designed, produced useful by-products, and provided the basis for a more sophisticated system.

Final results were (1) a book catalog to a centralized document collection, (2) a detailed handbook for continuing the basic system or converting to a controlled vocabulary system, (3) a computer program capable of conversion to an advanced system, and (4) recommendations for a sound, overall information program.

1. BOOK CATALOG

The book catalog enables the user to approach the document collection by subject via the Keyword Index, corporate author, contract number, and report number. In each of these approaches, the full document title, enhancement terms, date of report, and retrieval number are presented. The user then has the option of requesting the selected documents which are shelved in retrieval number order, or obtaining the full bibliographic citation from the Citation Index.

2. HANDBOOK

The handbook, "Procedures and Guide for the AFRPL Rapid Indexing System" appears as an appendix to this report. It describes the complete system, furnishes detailed indexing and editing procedures, and includes the corporate

author authority list. A thesaurus is added as a means of converting to a controlled vocabulary system. The suppressed word list has also been included for use in case the initial system is continued.

3. COMPUTER PROGRAM

The computer program, as it now stands, permits the initial system to continue in its present form. Further, the descriptor option to the program could be implemented. This would allow use of a controlled vocabulary in lieu of title permutation. It would also provide a printout of the descriptors as part of each bibliographic entry in the Citation Index.

4. RECOMMENDATIONS

A complete program, capable of meeting the information needs of AFRPL scientists and engineers, has been recommended. The program consists of (1) active selection and acquisition of documents, (2) controlled vocabulary documentation, (3) literature search service, and (4) the means for assuring knowledgeable use of the system.

Also presented for consideration were use of microfiche, an SDI program, a system for weeding the collection, and use of recently developed EDP equipment.

These recommendations constitute the logical growth direction of AFRPL's information program and were the product of a year's effort on the Rapid Indexing System.

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APPENDIX

PROCEDURES AND GUIDE FOR THE AFRPL RAPID INDEXING SYSTEM

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LIST OF ILLUSTRATIONS

Section I

THE INDEXING SYSTEM

1. DESCRIPTION

The Indexer is in control of the Rapid Indexing System's results. It is therefore essential that he have a working knowledge of the system's capabilities. This knowledge provides the Indexer with a basis for understanding the principles behind each rule and procedure. He is thus able to achieve desired results.

Each printout (report) is 110 characters or eleven inches long. This permits photoduplication if desired. The following printouts result from the "AFRPL INDEXING DATA" keypunch input sheets.

a. KWOC REPORT

The KWOC (Key Word Out of Context) Report consists of a keyword, which cannot exceed eighteen characters, followed by the document's title, date, and retrieval (accession) number. Each key word appears only once on each page.

Since the KWOC index is machine produced by permutation of the title and suppression of certain non-essential terms, it is subject to the computer's inflexible obedience to instructions. The computer:

(1.) Will not combine terms, the Indexer does this by inserting a hyphen between appropriate terms.

(2.) Will end a term on the eighteenth character whether or not it is the end of a word. The Indexer must make certain no term exceeds eighteen characters, or that it is intelligible without the last few letters.

(3.) Will not recognize the parts of a combination if spaces occur between the elements, it will index anything after a space separately. The computer will also drop any numbers not preceded by letters. For example, in

REP LR 19969-1

REP will appear under the R's, LR under the L's, and 19969-1 will be dropped.

(4.) Will accept exactly 72 characters in T1 of the keypunch input sheet. If only 71 characters appear, the 72nd character will be taken for a space between the last of T1 and the first letter of T2. In the word PROPELLANTS, for

example,

T1

P	R	O	P	E	L	L	
65	66	67	68	69	70	71	72

T2

A	N	T	S
1	2	3	4

will print out as PROPELL ANTS and index PROPELL under P and ANTS under A.

(5.) Will take a letter in the 72nd column of T1 to be a part of the word in the first column of T2. In MECHANIC HYRIDE, for example,

T1

M	E	C	H	A	N	I	C
65	66	67	68	69	70	71	72

T2

H	Y	D	R	I	D	E
1	2	3	4	5	6	7

will print out as MECHANICHYDRIDE and will be indexed under M.

Rules, procedures, and s[illegible] have been developed to meet the computer's strict adherence t[illegible] instructions.

b. AUTHOR REPORT

The Author Report, or corporate author index, presents the corporate author in alphabetical sequence, document title, date, and retrieval number. Like the KWOC index, the corporate author is limited to eighteen characters. However, spaces between words do not effect the printout, but alphabetical order is effected by spaces.

A corporate author authority list has been developed to establish a standard, preferred form for each corporate author and reduce it to eighteen characters. The preferred form is based upon the Chemical Propulsion Info[illegible]tion Agency corporate author index to the abstracts. Since the Defense Documentation Center's Corporate Author List (1 January 1966) is similar to that of the CPIA abstracts, it is used as the authorit[illegible] for authors not listed in CPIA abstracts.

c. CONTRACT REPORT

The Con[illegible]ct Report or contract number index lists contract numbers in alpha-numeric sequence. Under each contract number, titles of reports produced under the contract are listed in retrieval number order together with date of report and retrieval number.

While a space between parts of a contract number, or a sequence beginning with numbers, does not drop any portion of the sequence, it does change the alpha-numeric position of the number. AF04(611)-7432 will

index after AF 04(611)-7441 and AF 49(638)-25.

d. CITATION REPORT

The Citation Report (also known as accession list, shelf list, and bibliographic citation) lists full bibliographic information in retrieval (accession) number order.

As in the Author Report, the corporate author entry is limited to eighteen characters.

e. KEYWORD REPORT

This printout lists alphabetically the keywords appearing in the KWOC Report and notes the number of times each keyword has been used.

The Keyword Report does not list the suppressed words and therefore does not provide a count of the number of times each occurred. However, a procedure has been developed by which a frequency count of all words over 1 character in length can be obtained. Comparison with the Exclusion Word File yields the number of times each suppressed word occurred.

f. EXCLUSION WORD FILE

Approximately 860 "exclusion words" were stored in the computer for suppression in KWOC indexing. These are words of no value as indexing terms. In addition, all one and two character words are automatically suppressed.

Since only three to five words are added to the file each week, the printout is updated manually. Section IV lists the suppressed words.

g. ERROR REPORTS

Each report or printout is accompanied by an error report. These reports indicate machine detectable errors such as:

(1.) Gaps in retrieval number sequence

(2.) Use of same retrieval number more than once

(3.) Use of retrieval number with more or less than five characters

(4.) Truncated words: corporate authors and keywords of more than eighteen characters

Misspellings, joining of words that should be separate, treating a single word as two separate words, dropping of numbers in the KWOC Report, and incorrect alpha-numeric sequencing due to improper spacing on the transmittal sheet must be detected manually.

2. INDEXING PROCEDURES

Based upon the Rapid Indexing System's capabilities, the computer's unvarying response to established instructions, and the printouts (reports) produced by the computer program, the Indexer performs descriptive cataloging operations that yield the most accurate:

1. Title and title enhancement
2. Corporate author
3. Personal author
4. Date of document
5. Pagination
6. Number of references
7. Security classification
8. Contract number
9. Report number
10. Defense Documentation Center AD number

These elements are selected primarily from the information contained on the cover, title page, and last page of the document being indexed. It is occasionally necessary to consult the document's abstract and count the number of references at the end of each chapter. Since January 1964, information required for indexing appears on DD Form 1473, at the end of each document.

a. TITLE PAGE CODING

Indexing notations are coded on the title page of the document. This coding serves as instructions to the typist for filling out the Keypunch Transmittal Sheet (FIGURE 1). Title page coding is illustrated in FIGURES 2A to 2C. Resultant Keypunch Transmittal Sheet for these sample documents is shown in FIGURE 3.

(1.) TITLE AND TITLE ENHANCEMENT

In preparing the title entry, it is helpful to visualize the KWOC Index entries that will result from permutation of the keywords in the title. Therefore several factors should be considered:

(a) A total of 144 characters are available for title notation. This is ample space for most titles with room for additional keyword enhancement.

(b) Keywords are limited to eighteen characters.

(c) The computer takes a space to be the end of a keyword permuting the title.

(d) Numbers not preceded by letters are automatically dropped in the machine indexing process.

AFRPL INDEXING DATA

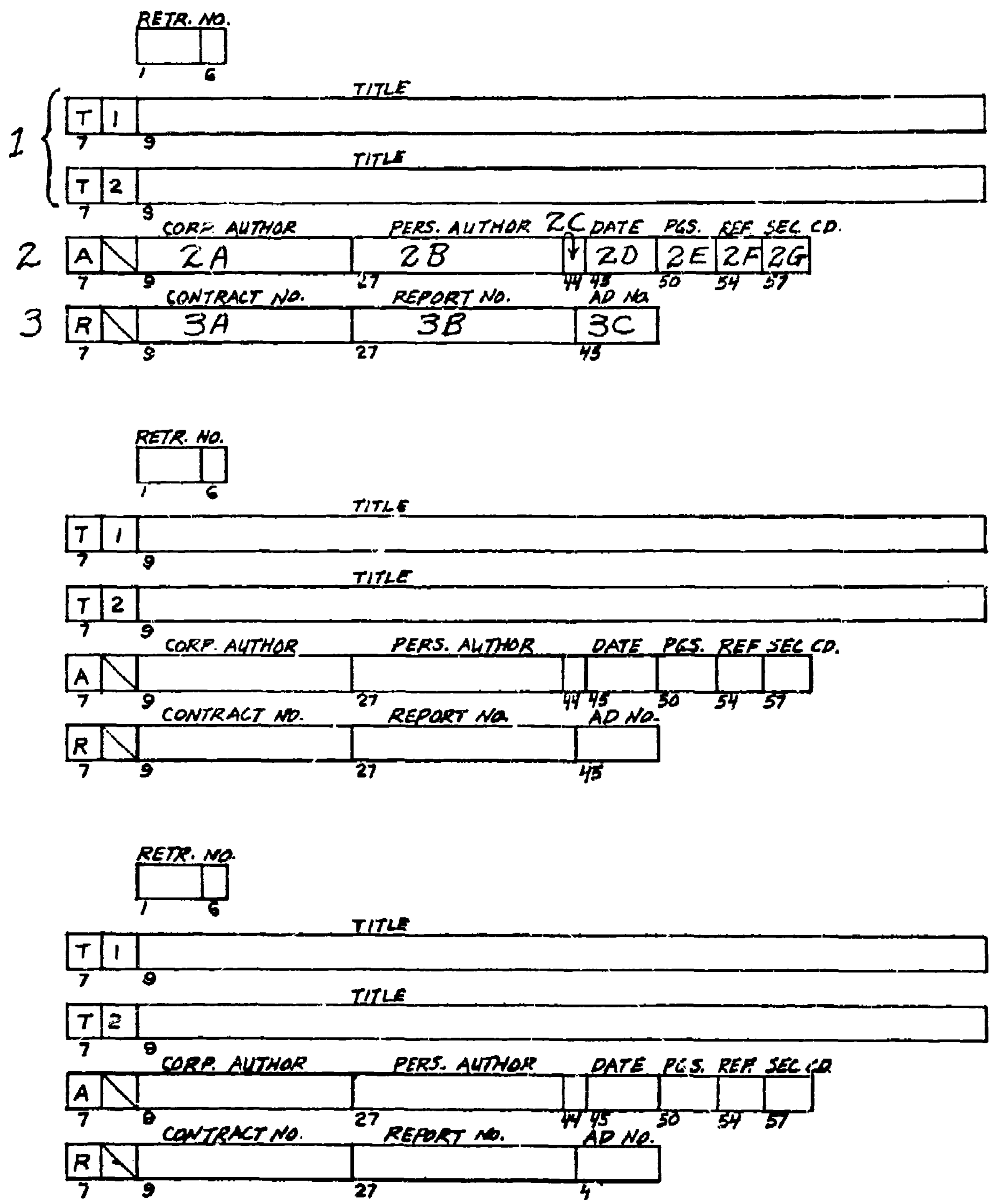


FIGURE 1 KEYPUNCH TRANSMITTAL SHEET SHOWING CODE NUMBERS USED IN MARKING DOCUMENT TITLE PAGES

AN EVALUATION OF INFORMATION RETRIEVAL-SYSTEMS

3B MEM~~ORANDUM~~ REP~~ORT~~ NO.-7170

2D SEP~~TEMBER 30, 1~~959

OPERATIONS RESEARCH

2A LOCKHEED AIRCRAFT ~~CORPORATION~~

~~CALIFORNIA DIVISION~~

2B - MUELLER M.W

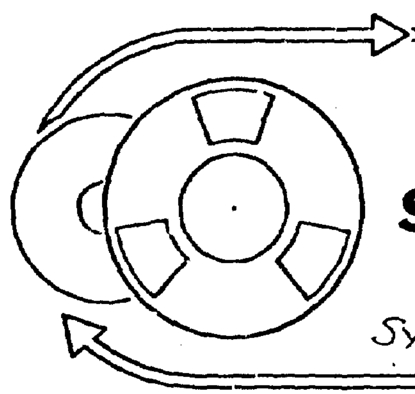
2E - 114

2F - 34

2G - U

FIGURE 2A DOCUMENT TITLE PAGE AS MARKED BY INDEXER FOR TYPING OF KEYPUNCH TRANSMITTAL SHEET

38 [LMSC-6-75-63-63]
20 [MAY 1963]
00002



1 [INFORMATION
STORAGE AND RETRIEVAL
LIBRARY SYSTEMS / RETRIEVAL-
SYSTEMS]

2E-33
2G-4

RESEARCH LABORATORIES

2A [**Lockheed** MISSILES] ~~& SPACE COMPANY~~
A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION • PALO ALTO, CALIFORNIA

FIGURE 2B DOCUMENT TITLE PAGE AS MARKED BY
INDEXER FOR TYPING OF KEYPUNCH TRANSMITTAL SHEET

SCIENTIFIC AND TECHNICAL INFORMATION CENTER

2B- SCRANTON R R
2C - *
2D - AUG 63
2E - 63
2F - 411
2G - U

[SPACECRAFT GUIDANCE, CONTROL and RELATED TOPICS

— A BIBLIOGRAPHY of the OPEN-LITERATURE —
January 1962 - June 1963]

3B [LR 17100] August 1963 [LOCKHEED-CALIFORNIA COMPANY] 2A

A DIVISION OF LOCKHEED AIRCRAFT CORP.

FIGURE 2C DOCUMENT TITLE PAGE AS MARKED BY INDEXER FOR TYPING OF KEYPUNCH TRANSMITTAL SHEET

AFRPL INDEXING DATA

RETR. NO. 00001

		TITLE
T	1	AN EVALUATIoN oF INFoRMATIoN RETRIEVAL-SYSTEMS.
T	2	

		CORP. AUTHOR	PERS. AUTHOR		DATE	PGS.	REF	SEC CD.
A		LoCKHEED AIRCRAFT	MUELLER M W		SEP59	114	34	U

		CONTRACT NO.	REPORT NO.	AD NO.
R			MEM-REP-No-7170	

RETR. NO. 00002

		TITLE
T	1	INFoRMATIoN SToRAGE AND RETRIEVAL LIBRARY-SYSTEMS /RETRIEVAL-SYSTEMS
T	2	

		CORP. AUTHOR	PERS. AUTHOR		DATE	PGS.	REF	SEC CD.
A		LoCKHEED MISSILES			MAY65	33		U

		CONTRACT NO.	REPORT NO.	AD NO.
R			LMSC-6-75-65-24	

RETR. NO. 00003

		TITLE
T	1	SPACECRAFT GUIDANCE, CoNTRoL & RELATED ToPICS--A BIBLIoGRAPHY oF THE oPE
T	2	N-LITERATURE, JANUARY 1962 - JUNE 1963.

		CORP. AUTHOR	PERS. AUTHOR		DATE	PGS.	REF	SEC CD.
A		LoCKHEED-CALIF	SCRANToN R R	*	AUG63	63	411	U

		CONTRACT NO.	REPORT NO.	AD NO.
R			LR-17100	

FIGURE 3 KEYPUNCH TRANSMITTAL SHEET SHOWING INFORMATION ENTERED FROM DOCUMENT TITLE PAGE CODING (FIGS. -)

(e) Certain characters are not available on machine print-out.

(f) The computer cannot handle subscript and superscript notations. This is particularly important in chemical symbols and mathematical formulas.

(g) Approximately 800 words in the Exclusion Word File will not be permuted as keywords. In addition to these words, all single character words are excluded.

(2.) TITLE ENTRY PREPARATION

The following rules have been developed to aid in title entry preparation:

(a) Couple terms that are too general singly, such as:

HIGH-
LIQUID-
SOLID-
-ENERGY
-PROPELLANT

(b) Separate the actual title from enhancement terms by leaving a space after the last letter of the title, entering a slant, and placing the first letter of the enhancement term directly after the slant, for example:

RESULTS OF AFRPL TECHNICAL INFORMATION FACILITY SURVEY /DOCUMENTATION INDEXES RETRIEVAL-SYSTEMS

(c) Select enhancement terms from existing thesauruses such as that of DDC and NASA wherever possible.

(d) Use title enhancement to add a second report number, other than AD. Precede such numbers with REP so that they all appear in the same section of the KWOC Index. Leave no spaces between parts of the number, otherwise each part will be indexed separately and numbers will be dropped. AFML TR 65-147 should be entered as REP-AFML-TR-65-147.

(e) Use title enhancement to spell out corporate authors that are overly confusing in their eighteen character reduction. However, unless the terms in the corporate author are suppressed, they will appear in the KWOC Index.

(3.) CLASSIFIED TITLE TREATMENT

The printouts must be kept unclassified so that they can receive the widest possible distribution and use. Therefore the Keypunch Transmittal Sheets and resultant printouts must contain no classified information. To avoid generating classified information:

(a) Substitute descriptors for the title. Select applicable descriptors from the DDC Thesaurus and the NASA Guide to the Subject Indexes for STAR.

(b) Do not select specific descriptors. Use the more general terms and do not index too deeply.

(c) Indicate that the terms are not the exact title by placing a slant before the descriptors.

(d) If the classification of the title is indicated on the document, state that the title is classified, as follows:

(CLASSIFIED TITLE) /DATA-ACQUISITION GUIDED-MISSILES TELEMETERING

The words CLASSIFIED and TITLE have been suppressed and therefore will not appear in the KWOC Index.

(e) If classification of the title is not indicated on the document, enter the selected descriptors as follows:

/DATA-ACQUISITION GUIDED-MISSILES TELEMETERING

This example provides sufficient indication of the document's subject matter without mentioning specific missiles, the portion of the missile under study, the project, of details of the acquisition system.

b. CORPORATE AUTHOR

The corporate author is limited to eighteen characters. This eighteen character reduction appears both in the Author Report and as the corporate author entry of the full bibliographic printout on the Citation Report.

It is essential that the eighteen character reduction be easily identifiable as the corporate author it represents. To achieve this a Corporate Author Authority List has been developed (SECTION II) for many of the likely authors to be encountered in the AFRPL collection.

The following guide lines are set down to provide a uniform method for establishing additional corporate author entries and for limiting them to eighteen characters:

(1.) Corporate authors are cited in the form by which they are most generally known. The Chemical Propulsion Information Agency (CPIA) abstracts author index serves as the authority. The DDC Corporate Author List is used for authors not appearing in the CPIA abstracts.

(2.) The corporate author is always based upon the title page of the document being indexed. Therefore, on older documents the older designation of the corporation is used. See Also cross references are used in the Corporate Author Authority List to bring these variations together. For example:

Chemical Propulsion Information Agency
See Also: Liquid Propellant Information Agency
Solid Propellant Information Agency

(3.) Standard abbreviations are used wherever possible. The list of abbreviations used appears as part of Section II.

(4.) Corporate authors are subdivided both by geographical location and name of division, as used by the corporation.

(5.) When a subdivision, used as the main entry, differs from the corporate author, See Also cross references are used, for example:

Thiokol Chemical Corporation
See Also: Reaction Motors

Purdue University
See Also: Jet Propulsion Center

(6.) On British documents, drop "Ministry of" and go directly to the unit concerned. For:

Ministry of Supply. Explosives Research and Development Establishment.

Enter corporate author as:

Explosives Research and Development Establishment.

Retain "Royal" as in:

Royal Armament Research and Development Establishment.

Do not go to the very specific unit, especially if it is not part of the report number, for example:

Royal Aarmament Research and Development Establishment. Weapons and Ammunition Division. RARDE Memorandum 19/63.

Enter corporate author as:

Royal Armament Research and Development Establishment.

(7.) Omit U.S. on all United States government organizations, as:

Bureau of Mines
Naval Air Test Station

(8). Omit: Company, Corporation, Incorporated, Limited, etc. but retain Establishment.

c. PERSONAL AUTHOR

Enter the last name first, no comma, and no periods after the initials.

John Peter Vinti would be set down as:

VINTI J P

Only the first of a series of authors can be entered. Indicate that there are several authors by an asterisk in column 44 of the third card (box 2C of FIGURE 1). The computer will automatically printout "ET AL."

d. DATE OF REPORT

Always enter the date the report was originally issued. Only five characters are available for the date, therefore reduce all months to three characters, leave no space, and enter the last two numbers of the year. The day of the month must be omitted. September 15, 1965 would be entered as SEP65.

If a report was revised at a later date, enter the original date in 2D of FIGURE 1, and the revision date as title enhancement. For example, a report written in June of 1964 and revised on October 3, 1965 would have JUN64 in box 2D and the title enhancement would appear as follows:

...INVESTIGATION /REVISED OCTOBER 3, 1965

Occasionally a classified report is recalled and reissued as an unclassified version with new covers and title page. The new title page bears both the original issue date and the declassified date. Enter the original issue date in box 2D of FIGURE 1 and enhance the title as follows:

e. PAGINATION

Most documents are consecutively paged. Enter the last page number in box 2E of FIGURE 1 to indicate the total number of pages.

Some reports page each chapter separately. Rather than count each page, enter VP for "various pagination" in box 2E.

f. REFERENCES

Enter the total number of references in box 2F of FIGURE 1.

In most reports, the references are consecutively numbered and either gathered at the end of the document or treated as footnotes at the bottom of each page. In these situations, merely use the highest number as the total number of references. Other reports number the references separately for each chapter and gather the references at the end of each chapter or as footnotes at the bottom of each page. Add the highest number in each chapter if there aren't too many chapters, otherwise leave 2F blank.

g. SECURITY CLASSIFICATION

Use the following code to designate the security classification of a document in the Security Code (SEC CD) box 2G of FIGURE 1:

U	for unclassified
URD	for unclassified restricted data
C	for confidential
CRD	for confidential restricted data
S	for secret
SRD	for secret restricted data

h. CONTRACT NUMBER

Enter the contract number in box 3A of FIGURE 1. Do not leave a space between any portion of the number. A space will cause the number to be indexed out of its proper alpha-numeric sequence.

No provision has been made for listing the task and project numbers of individual contracts nor for listing more than one contract number per document. Where significant, additional numbers can be treated as title enhancement items.

i. REPORT NUMBER

Enter the Department of Defense agency number in box 3B of FIGURE 1 and the Defense Documentation Center AD number in box 3C.

Should the document also have a contractor's report number it is to be treated as a title enhancement item. Prefix it with REP and leave no spaces between parts of the number. AFRPL TR 65-157 is also Lockheed Report LR 19040. Therefore AFRPL TR 65-157 would be entered in box 3B and Lockheed's number would appear in the title as:

...SURVEY /REP-LR-19040

j. DEFENSE DOCUMENTATION CENTER NUMBER

Defense Documentation Center AD numbers must be entered as six digit numbers in box 3C of FIGURE 1. AD numbers with five digits or less must be preceded by the number of zeros required to complete a six digit number. The "AD" is omitted because the computer will automatically printout AD before any number appearing in this box.

For AD-9375, enter 009375 in box 3C.

k. ERROR CORRECTIONS

Column 6 of the Retrieval Number box on the Keypunch Transmittal Sheet, FIGURE 1, is used to correct errors or add information such as a Defense Documentation Center AD number. It is also used to delete an entire card and to reinstate deleted cards.

To make a change, type the Retrieval Number of the document concerned and enter "A" in column 6 for the first change, "b" for the change that supersedes "A", and so on through "W". Only the additional or corrected information need be entered on the Transmittal Sheet.

FIGURE 4 illustrates three corrections to the documents illustrated in FIGURE 3. The first example shows the addition of a Defense Documentation Center AD number. The second shows the addition of a contract number and adding "REP" to the report number. The final example shows the addition of a NASA number as a title enhancement item.

To delete an entire entry, type the Retrieval Number and an "X" in column 6 on a Keypunch Transmittal Sheet. Now, despite any earlier corrections, all information associated with this entry will be removed from future printouts.

To reinstate a deleted entry, place the number "1" in column 6. To make corrections to the information in the reinstated entry, place a number "2" in column 6. Warning - a reinstated entry can never be deleted again.

l. OBTAINING JOB RUNS

The KWOC Job Run Set Up Sheet, shown in FIGURE 5 is used to obtain printouts. With this form the Indexer may have the AFRPL Data

AFRPL INDEXING DATA

RETR. NO.

00001	A
1	6

		TITLE
T	1	
7		9

		TITLE
T	2	
7		9

		CORP. AUTHOR	PERS. AUTHOR		DATE	PGS.	REF.	SEC CD.
A								
7		9	27	44	45	50	54	57

		CONTRACT NO.	REPORT NO.	AD NO.
R				095376
7		9	27	45

RETR. NO.

00002	A
1	6

		TITLE
T	1	
7		9

		TITLE
T	2	
7		9

		CORP. AUTHOR	PERS. AUTHOR		DATE	PGS.	REF	SEC CD.
A								
7		9	27	44	45	50	54	57

		CONTRACT NO.	REPORT NO.	AD NO.
R		AF04(611)-7432	REP-LMSC-6-75-65-24	
7		9	27	45

RETR. NO.

00003	A
1	6

		TITLE
T	1	SPACECRAFT GUIDANCE, CONTROL AND RELATED TOPICS--A BIBLIOGRAPHY OF THE??
7		9

		TITLE
T	2	OPEN-LITERATURE, JANUARY 1962 - JUNE 1963. /NASA-N64-11412
7		9

		CORP. AUTHOR	PERS. AUTHOR		DATE	PGS.	REF.	SEC CD.
A								
7		9	27	44	45	50	54	57

		CONTRACT NO.	REPORT NO.	AD NO.
R				
7		9	27	45

FIGURE 4 USE OF KEYPUNCH TRANSMITTAL SHEET TO CORRECT ERRORS

LOCKHEED INDEXING
EXT. 32305

KWOC JOB RUN SET UP SHEET

TØ: ______________ DATE: ______________

BY: ______________

RUN NUMBER 57 |__|__| 58 FIRST CARD INPUT ________ (INCLUDES
LAST CARD INPUT ________ TRANSMITTALS)

FIRST RETRIEVAL NUMBER 45 |__|__|__|__|__| 49
LAST RETRIEVAL NUMBER 51 |__|__|__|__|__| 55

KWØC REPØRT YES NØ 59
AUTHOR REPORT YES NØ 60
CØNTRACT REPØRT YES NØ 61
CITATIØN REPØRT YES NØ 62
KEYWORD REPORT YES NØ 63 (JØBS X8625 (SORT) AND X8626)
EXCLUSION WORD FILE YES NØ 64 X8622 X-WDS DATA

THIS RUN WILL REQUIRE THE FOLLOWING INPUT(S):
TRANSMITTALS YES NØ CARDS YES NØ (UTILITY UPDATE)
DATA TAPES: RUN ______ RUN ______ (SPECIFY TØTAL NUMBER
RUN ______ RUN ______ OF INPUTS ON X8620
RUN ______ RUN ______ SORT CONTROL CARDS
RUN ______ RUN ______ 1 FOR FIRST LINE
RUN ______ RUN ______ AND 1 FOR EACH
RUN ______ RUN ______ RUN TO BE INCLUDED)

SAVE INPUT DATA YES NØ: (SPECIFY UNLOAD OF X8620 SORT INPUT AND RETENTION OF TAPE(S).)

RETURN CARDS TØ LØCKHEED INDEXING YES NØ
NUMBER ØF COPIES OF REPORT TO BE PRINTED ______
NUMBER ØF CØPIES TØ LØCKHEED INDEXING ______
DISTRIBUTION ØF ØTHER CØPIES: ______________

NØTES: ______________

FIGURE 5 KWOC JOB RUN SET UP SHEET

Processing Programmer run: (1) the Keypunch Transmittal sheets only, (2) punched cards only, (3) data tapes only, or (4) any combinations of these three inputs.

The Indexer can also obtain all the various reports: KWOC, Author, Contract, Citation, Keyword, and Exclusion Word File by circling "YES" after each report. He can elect to receive only one of the reports by circling "NO" after the reports he does not want.

3. SPECIAL SYMBOLS, NOTATION AND TYPING INSTRUCTIONS

Since the computer is limited in the symbols it can print, substitutions must be made. The computer is also unable to print subscripts and superscripts. Therefore special rules have been devised for chemical and mathematical notations.

The following table shows what the computer will print in response to an input. Many of the items are not indexed in the KWOC report. Circled symbols are indexed only if following an alphabetic character.

TYPED	KEYPUNCHED	PRINTED
0-9	0-9	0-9
A-Z	A-Z	A-Z (Ø)
+	+	+ Not Indexed
.	.	. Not Indexed
)	)	) Not indexed without left (preceding it
-	-	-
$	$	$ Not Indexed
*	*	*
,	,	, Not Indexed
(	(	(
/	/	/ Not indexed
-	-	-
@	@	' Not Indexed
?	Space	Space

TYPED	KEYPUNCHED	PRINTED
%		(
#		-
::		Space
;		Space

[1]NOTE: R+D would not index. Only the word before the plus sign would index. Since "R" is a single character it is automatically excluded in the KWOC Index.

RESEARCH+DEVELOPMENT. Only RESEARCH would index. For both "Research" and "Development" to index, a space must be left on either side of the plus sign. However, the + would be dropped out, RESEARCH would be indexed under the R's, and DEVELOPMENT would index separately under the D's.

a. SUBSTITUTION OF SYMBOLS

When an apostrophe is desired, type an @ sign.

In place of a colon, use a comma, a single hyphen, a double hyphen, or a space. Select which ever is most appropriate to the sense of the title. For example:

TERNARY METALS: AN ANNOTATED BIBLIOGRAPHY

can be typed as

TERNARY METALS -- AN ANNOTATED BIBLIOGRAPHY

In place of a semicolon, use a comma or a hyphen as appropriate to the sense of the title, for example:

STUDY OF WIND MEASUREMENTS; PROGRESS REPORT FOR MAY 1966

can be typed as

STUDY OF WIND MEASUREMENTS - PROGRESS REPORT FOR MAY 1966

b. CHEMICAL NOTATION

The computer does not print lower case letters, subscripts, or the · for separating radicals. Therefore use all capital letters, except for the "O" which must be typed in lower case to distinguish it from zero; type all subscript numbers on the line; and use an asterisk to separate

radicals.

$NaBSO_4 \cdot 10H_2O$

would be typed as

NABSo4*10H2o

c. MATHEMATICAL NOTATION

Indicate superscripts by using a double asterisk. For example:

3.8×10^{33}

would be typed as

3.8X10**33

d. TYPING KEYPUNCH TRANSMITTAL SHEET

Type all capital letters except for the letter "o" as shown in FIGURE 3.

If a word ends in the 72nd column on line T1, start T2 with a question mark of the last word in T1 will be tied to the first word in T2 without a space.

Always enter 72 characters in T1 before going on to T2, even if it is not the proper place to hyphenate the word. See the last example in FIGURE 3.

4. INDEXING AND EDITING GUIDE

The rules which follow are keyed to examples in the printout covering Retrieval Numbers 00001 through 00585.

a. SUPPRESSED TERMS

As a general rule, suppressed terms should be held to a minimum. While suppressing a term may often by the easiest way to obtain a desired result, other methods will work equally well. These methods are presented and illustrated in the topics which follow.

b. SUBTITLES

Meaningless keywords frequently result from subtitles. Rarely does information contained in subtitles add substantially to the citation's information content. Subtitles should be omitted wherever possible.

(1.) Symposia - Many symposia subtitles contain the name and location of the hotel where the conference was held. Such

useless keywords as:

CALIFORNIA	MENLO
FLORIDA	PARK
FLORIDAN	TAMPA
HOTEL	WASHINGTON

are generated by the subtitles. This information should be deleted from the citation.

(2.) Reports - Subtitles particularly of periodic reports, produce such useless keywords as:

ANNUAL	COVERING
APPENDIX	ENDING
BOOK	PERIOD
COVERED	PROF
	SEMI

These terms can be deleted from the title without decreasing the information content of the citation.

c. ALPHA-NUMERIC DESIGNATIONS

Care must be exercised to hyphenate alpha-numeric designations in a manner that will prevent portions of a combination from dropping out of the keyword. The computer program causes the following to occur:

(1.) Numerals, not preceded by alphabetic characters, drop out. For example, 4-DS-93000 prints out as DS-93000, NORD 1026 merely yields NORD.

(2.) In numerals following a comma, both the comma and the numerals drop out. KS-12,000 prints out as KS-12.

(3.) A virgule (/) does not print out as part of a keyword nor do the characters following it. LAU-6/A prints out as LAU-6.

(4.) Parenthesis will print out as part of a keyword if not preceded by a space. These keywords are, therefore, possible: DDP(80),EJC(90), and MOTORS (X226-A-3). However, since parenthesis preceded by a space drop out, (FBO)3 prints out as FBO.

Certain alpha numeric combinations are meaningless as keywords. To overcome this problem, either place the combination after the noun it modifies or append a descriptive term.

In Place Of	Use	Retrieval Number
4-DS-93000	JATO-4-93000	00523
NORD 10260	NORD-10260	00351
KS-12,000	KS-12000	00191
LAU-6/A	LAU-6-A	00122
(FBO)3	FBO3	00574
A-EO-51	FLIGHT-A-EO-51	00178
II-C-22	TEST-PLAN-II-C-22	00176
TX8	ROCKET-TX8	00182
PROJECT ABLE-1	ABLE-1-PROJECT	00187

d. ACRONYMS, ABBREVIATIONS, AND PHRASES

Spell out meanings of acronyms and abbreviations that are not in general use. Join abbreviations and ambiguous terms to the nouns they modify even if their position in a title must be reversed. Let the 18 character keyword limitation cut off the resulting combinations of greater length.

In Place Of	Use	Retrieval Number
ABL	ALLEGANY-BALLISTICS-LABORATORY	00500
B-N	B-N-PROPELLANTS	00052
BALL	BALL-PROPELLANTS	00424
AFB	EDWARDS-AFB	00355
AIR	AIR-FORCE	00274
ALLEGANY	ALLEGANY-BALLISTICS-LABORATORY	00466
BUREAU	BUREAU-OF-ORDNANCE	00507
DEPARTMENT OF DEFENSE	DEFENSE-DEPARTMENT	00004
GRAND	GRAND-CENTRAL-ROCKET	00457
HYPER	HYPER-PERFORMANCE	00322

In some instances, it is advisable to repeat a word as a title enhancement term so that it is not lost as an indexing point. In the combinations BALL-PROPELLANTS and B-N-PROPELLANTS, the word PROPELLANTS should be added as a title enhancement term.

e. REPORT NUMBERS IN TITLES

The "Report No." box (Line R, Cols. 27-44) of the Keypunch Transmittal Sheet gives preference to the DOD agency report number. Columns 45 through 51 of Line R are reserved for the DDC AD number. Any additional report numbers such as the contractor's number, progress report number, monthly, quarterly, and letter report numbers are treated as title enhancement terms.

It is desirable to print out the contractor's distinctive report numbers as keywords but to suppress the progress, monthly quarterly, and letter report numbers.

(1.) Individual Report Numbers

To gather these numbers under a single heading in the KWOC index, they are preceded by "REP" for "report". CPIA PUB-14 is entered as REP-CPIA-PUB-14.

Occasionally, this method produces an alpha-numeric sequence of over 18 characters, causing all characters over 18 to drop out of the keyword. In REP-RE-65-110-CRE-32, for example, the "32" would drop out. By deleting the hyphens separating letters from numbers, the report number can be presented as REP-RE65-110-CRE32 without causing confusion.

(2.) Series Report Numbers

Progress report numbers are not of sufficient value to justify keyword print out. They can be suppressed by deleting the hyphen. Instead of PR-43, enter PR 43. The PR drops out because all 1 and 2 character words are suppressed and the 43 drops out because all numbers not preceded by a letter are automatically suppressed.

Monthly, quarterly, and letter report numbers can be similarly suppressed. MONTHLY, QUARTERLY, LETTER, and REPORT are suppressed terms, but REP is not. Instead of QUARTERLY REP-39, enter QUARTERLY REPORT 39. This provides full information in the title but yields no keyword printout.

Both SEMI and ANNUAL are suppressed terms. SEMI-ANNUAL and SEMIANNUAL will print out as keywords, but SEMI ANNUAL will not.

f. MISCELLANEOUS

(1.) Ordinal Numbers

FIRST, SECOND, ... , TENTH have not been added to the suppressed word list. To include them in the title but suppress them as keywords, change them to 1ST, 2ND, ... , 10th.

SECOND RADAR ATTENUATION SYMPOSIUM

would be entered as:

2ND RADAR ATTENUATION SYMPOSIUM

(2.) Effect of Hyphen

The hyphen can cause individually suppressed terms to unintentionally print out in combination. Care must be be exercised to avoid the following situations:

(a) Months - All months are suppressed terms. However, when combined as APRIL-JUNE for example, the combination will print out as a keyword. This is avoided by leaving a space on each side of the hyphen.

(b) Parts - The term PART is suppressed but PART-1, PART 2, etc. are not. Avoid keyword print out by deleting the hyphen and entering the term as PART 1, PART 2, etc.

(c) Model Numbers - Such model numbers as M-2, M-55, SM-62 can be eliminated from keyword print out by entering them in the title as M 2, M 55, SM 62.

SECTION II

CORPORATE SOURCE AND ABBREVIATION LISTS

The following section consists of three parts:

1. ABBREVIATED CORPORATE SOURCE NAME is an alphabetical arrangement of the shortened, eighteen Character Corporate source name used to designate corporate sources in the author printout. The user of the index can refer to this list to find the complete name of a corporate source opposite its eighteen character designation.

2. CORPORATE SOURCE AUTHORITY LIST is an alphabetical arrangement of Corporate Authors with their shortened eighteen character designation opposite. The indexer can use this list to locate a desired shortened corporate source designation opposite the complete corporate source name.

3. ABBREVIATIONS USED IN CORPORATE SOURCE DESIGNATIONS is a alphabetical listing of words which frequently appear in corporate source entries with their standardized abbreviations opposite.

1. ABBREVIATED CORPORATE SOURCE NAME

Aberdeen Prov Grd	Aberdeen Proving Ground
Acoustica Assocs	Acoustica Associates
Adaptronics	Adaptronics, Incorporated
Adm Mat Lab UK	Admiralty Materials Laboratory (U.K.)
Adv Metals Res Lab	Advanced Metals Research Corp.
Advis Grp Aero R+D	Advisory Group for Aeronautical Research and Development
Advis Pan on Fuels	Ad Hoc Group on Solid-Propellant Instability of Compustion. Advisory Panel on Fuels and Lubricants
Advis Pan on Ord	Ad Hoc Group on Solid-Propellant Instability of Combustion. Advisory Panel on Ordnance, Transport, and Supply
Aero Res Assocs	Aerospace Research Associates
Aero Res Labs	Aerospace Research Laboratories
Aero Tech Intel C	Aerospace Technical Intelligence Center
Aerochem Res Lab	Aerochem Research Laboratories

Aerojet Eng	Aerojet Engineering Corp
Aerojet-Gen/Adv Sy	Aerojet-General Corporation, Advanced Systems
Aerojet-Gen/Aerov	Aerojet-General Corporation, Aerovessels Division
Aerojet-Gen/Aetron	Aerojet-General Corporation, Aetron-Covina Plant
Aerojet-Gen/Astri	Aerojet-General Corporation, Astrionics
Aerojet-Gen/AZU	Aerojet-General Corporation, Azusa
Aerojet-Gen/Chem	Aerojet-General Corporation, Chemical Division
Aerojet-Gen/Liquid	Aerojet-General Corporation, Liquid Rocket Plant
Aerojet-Gen/Nucl	Aerojet-General Corporation, Nucleonics
Aerojet-Gen/Ord	Aerojet-General Corporation, Ordnance Division
Aerojet-Gen/REON	Aerojet-General Corporation, REON Division
Aerojet-Gen/Res	Aerojet-General Corporation, Research Division
Aerojet-Gen/Rocket	Aerojet-General Corporation, Rocket Engine Operations - Nuclear
Aerojet-Gen/Sacra	Aerojet-General Corporation, Sacramento
Aerojet-Gen/Solid	Aerojet-General Corporation, Solid Rocket Plant
Aerojet-Gen/VonKar	Aerojet-General Corporation, Von Karman Center
Aeron Res Assocs P	Aeronautical Research Associates of Princeton, Inc.
Aeron Res C UK	Aeronautical Research Council (U.K.)
Aeronautical Sys D	Aeronautical Systems Division
Aeronca Mfg.	Aeronca Manufacturing Corp.
Aeronutronic/Ford	Aeronutronic, Division of Ford Motor Co.
Aerophysics Dev	Aerophysics Development Corporation

Aeroprojects	Aeroprojects, Inc.
Aeroquip	Aeroquip Corporation
Aerospace	Aerospace Corp.
Aerospace Chem Sys	Aerospace Chemical Systems, Inc.
AF Aero Prop Lab	Air Force Aero Propulsion Laboratory
AF Aero Med Res L	Air Force Aerospace Medical Research Labs
AF Ballis Mis Div	Air Force Ballistic Missile Division
AF Flight Test C	Air Force Flight Test Center
AF Inst Technology	Air Force Institute of Technology
AF Logistics Comd	Air Force Logistics Command
AF Materials Lab	Air Force Materials Laboratory
AF Missile Devel C	Air Force Missile Development Center
AF Office Sci Res	Air Force Office of Scientific Research
AF Rocket Prop Lab	Air Force Rocket Propulsion Laboratory
AF Spec Weapons C	Air Force Special Weapons Center
AF Systems Comd	Air Force Systems Command
AF Weapons Lab	Air Force Weapons Laboratory
Air Materiel Comd	Air Materiel Command
Air Prod and Chem	Air Products and Chemicals, Inc.
Air Products	Air Products, Inc.
Air R+D Comd	Air Research and Development Command
Air Reduction	Air Reduction Company, Inc.
Air Tech Intell C	Air Technical Intelligence Center
Air University	Air University
	Airesearch Manufacturing Company, Division of the Garrett Corporation See: The Garrett Corporation, Airesearch Manufacturing Co. Division

Armed Forces SWP	Armed Forces Special Weapons Project
Armour Res Fdn	Armour Research Foundation
Army Ballistic MA	Army Ballistic Missile Agency
Army Chem Center	Army Chemical Center
Army Library	Army Library, Washington D.C.
Army Materials Res	Army Materials Research Agency
	Army Missile Command See: Redstone Arsenal
Army Missile Tes/C	Army Missile Test Center
Army Rocket GMA	Army Rocket and Guided Missile Agency See Also: Redstone Arsenal
Arnold Eng. Dev C	Arnold Engineering Development Center
ARO	ARO, Inc.
Arthur D. Little	Arthur D. Little, Inc.
Ashland Oil + Ref	Ashland Oil and Refining Company
Assist Sec Def R+D	Office of the Assistant Secretary of Defense (Research and Development)
Assist Sec Def S+L	Office of the Assistant Secretary of Defense (Supply and Logistics)
ASTIA	Armed Services Technical Information Agency
ASTRO	Astro, a division of the Marquardt Corp.
Astrodyne	Astrodyne, Incorporated
Astropower	Astropower, Inc.
Astrosystems Int	Astrosystems International, Inc.
Atlantic Research	Atlantic Research Corp.
Atomic En Com	Atomic Energy Commission
Atom En Com/DTI	Atomic Energy Commission, Division of Technical Information
Atomics Int/NAA	Atomics International, North American Aviation

Alcoa Res Lab	Alcoa Research Laboratory
Alcor	Alcor, Inc.
Allen B. Dumont L	Allen B. Dumont Laboratories, Inc.
Allied Chem + Dye	Allied Chemical + Dye Corp.
Allied Chemical	Allied Chemical Corp.
Allied Res Assocs	Allied Research Associates, Inc.
Allison/GMC	Allison Division of General Motors Corporation
Alloyd Electronics	Alloyd Electronics Corporation
Althea Revere	Althea Revere, Vineyard Haven, Mass.
Alum Co America	Aluminum Company of America
Aluminum Res Labs	Aluminum Research Laboratories
Am Cyanamid	American Cyanamid Company
Am Mach + Foundry	American Machine and Foundry Corp.
Am Potash and Chem	American Potash and Chemical Corp.
Amcel Propulsion	Amcel Propulsion, Inc.
Amer Rad+Std Sanit	American Radiator and Standard Sanitary Corporation
Amer Rein Plastics	American Reinforced Plastics Company
Amer Soc Mech Eng	American Society of Mechanical Engineers
Analytic Services	Analytic Services, Incorporated
A O Smith	A. O. Smith Corp.
App Phys L J Hop U	Applied Physics Lab., Johns Hopkins University
Applied Science L	Applied Science Laboratories, Inc.
Arde Associates	Arde Associates
Argonne National L	Argonne National Laboratory
Arm Ser Explo Safe	Armed Services Explosives Safety Board

Atom Weap Res Est	Atomic Weapons Research Establishment
Auburn U	Auburn University
Automation Ind	Automation Industries, Inc.
Autometric	Autometric Corporation
AVCO	AVCO Corporation See Also: Lycoming Division
AVCO-Everett Res L	AVCO-Everett Research Laboratory
Babcock Wilcox Res	Babcock and Wilcox Co., Research Center
Ballistic Res Lab	Ballistic Research Laboratories
Ballistic Sys Div	Ballistic Systems Division
Battelle Memorial	Battelle Memorial Institute See Also: Defense Metals Information Center, Radiation Effects Information Center
Battelle-Northwest	Battelle-Northwest (Pacific Northwest Laboratory operated by Battelle)
Becco Chemical/FMC	Becco Chemical Division, Food Machinery and Chemical Corp.
Beech Aircraft	Beech Aircraft Corporation
Beechcraft R+D	Beechcraft Research and Development
Bell Aerosystems	Bell Aerosystems Company
Bell Aircraft	Bell Aircraft Corporation
Bendix	The Bendix Corporation
Bendix Aviation	Bendix Aviation Corporation
Bermite Powder	Bermite Powder Company
Beryllium	The Beryllium Corporation
Bethlehem Steel	Bethlehem Steel Co.
Bettis Atomic Pow L	Bettis Atomic Power Laboratory, Pittsburgh, Pa.
Bjorksten Res Lab	Bjorksten Research Laboratories, Inc.

Columbia Radiat L	Columbia Radiation Laboratory
Combust+Explos Res	Combustion and Explosives Research, Inc.
Comm Fuels + Lub	Committee on Fuels and Lubricants, Research Development Board
Comm Under Warfare	Committee on Undersea Warfare, National Research Council
Commercial Solvent	Commercial Solvents Corporation
Compo Tek	Compo Tek Inc., Palo Alto
Conesco	Conesco, Inc.
Conn Hard Rubber	Connecticut Hard Rubber Company
Convair Astro	Convair Astronautics See also: General Dynamics/Convair
Convair/Ft Worth	Convair, Fort Worth
Convair/Thermo L	Convair, Thermodynamics Laboratory
Coordinating Res C	Coordinating Research Council, Inc.
U Copenhagen	University of Copenhagen
Cornell Aeron Lab	Cornell Aeronautical Laboratory, Inc.
Cornell U	Cornell University
Cosmodyne	Cosmodyne Corporation
Curtiss-Wright	Curtiss-Wright Corporation
Daniel Mann et al	Daniel, Mann, Johnson, and Mendenhall
U Dayton	University of Dayton
U Dayton Res Inst	University of Dayton Research Institute
Debell + Richardson	Debell and Richardson, Inc.
Def Metals Info C	Defense Metals Information Center
Defense Document C	Defense Documentation Center
Defense Research	Defense Research Corporation
Defense Research L	Defense Research Laboratories
U Delaware	University of Delaware

Boeing	The Boeing Company
Bolt Beranek et al	Bolt Beranek and Newman, Inc.
Booz Allen + Ham	Booz, Allen + Hamilton
Borg-Warner	Borg-Warner Corporation See Also: Pesco Products Division
U British Columbia	University of British Columbia
British Oxygen	The British Oxygen Co.
Brown U	Brown University
Brunswick	Brunswick Corp.
Brush Beryllium	Brush Beryllium Company
U Brussels	University of Brussels
Bucyrus-Erie	Bucyrus-Erie Company
Buffalo Elect-Chem	Buffalo Electro-Chemical Company, Inc.
U Buffalo	University of Buffalo
Building Res Sta	Building Research Station Watford, England
Bureau Aeronautics	Bureau of Aeronautics
Bureau of Mines	Bureau of Mines
Bureau of Ships	Bureau of Ships
Calif Inst of Tech	California Institute of Technology See Also: Jet Propulsion Laboratory Guggenheim Aeronautical Labs Guggenheim Jet Propulsion Center
California Res	California Research Corp.
U California	University of California
U California L A	University of California at Los Angeles
Callery Chemical	Callery Chemical Company
Cambridge	Cambridge Corporation
Canadian Arm R+D	Canadian Armament Research and Development Establishment

Canadian R+D Estab	Canadian Research and Development Establishment
Carborundum	Carborundum Company
Carnegie Inst Tech	Carnegie Institute of Technology
Case Inst Tech	Case Institute of Technology
Catholic U America	Catholic University of America
Celestial Research	Celestial Research Corp.
Century Engineers	Century Engineers Inc.
Chance Vought	Chance Vought Corporation
Chem Def Exp Est	Chemical Defense Experimental Establishment (U.K.)
Chem Prop Info Ag	Chemical Propulsion Information Agency. Johns Hopkins University See Also: Liquid Propellant Information Agency, Solid Propellant Information Agency
Chicago Aerial Ind	Chicago Aerial Industries, Inc.
U Chicago	University of Chicago
Chrysler	Chrysler Corporation
U Cincinnati	University of Cincinnati
Clemson College	Clemson College
Cleveland Ind Res	Cleveland Industrial Research, Inc.
Clevite	Clevite Corporation
Climax Molyb/Mich	Climax Molybdenum Company of Michigan
Coated Text Mills	Coated Textile Mills, Inc.
College of Aero UK	College of Aeronautics (U.K.)
College Place Coun	College Placement Council, Inc.
Colo Sch Mines RE	Colorado School of Mines Research Foundation
U Colorado	University of Colorado

U Denver	University of Denver
Denver Research In	Denver Research Institute
Dept Air Force	Department of the Air Force
Dept of Defense	Department of Defense, Washington, D.C.
Diamond Alkali	Diamond Alkali Company
Dir Advanced Sys T	Directorate of Advanced Systems Technology
Dir Aerospace Saf	Directorate of Aerospace Safety
Dir Rock Prop+Mis	Directorate of Rocket Propulsion Missiles
Douglas Aircraft	Douglas Aircraft Company, Inc.
Dow Chemical	The Dow Chemical Company
Dow Corning	Dow Corning Corporation
U Durham	University of Durham
Dynamic Science	Dynamic Science Corporation
Dynatech	Dynatech Corporation
E H Sargent	E. H. Sargent & Company
E I Du Pont de Nem	E. I. Du Pont de Nemours and Company
Edgewood Arsenal	Edgewood Arsenal
Edwal Labs	The Edwal Laboratories, Inc.
Electro Jet	Electro Jet Corporation
Electro-Mech Lab	Electro-Mechanical Laboratory
Electro Optical Sy	Electro Optical Systems, Inc.
Electro-Therm Inds	Electro-Thermal Industries, Inc.
Electronic Sys Dev	Electronic Systems Development Corp
Electronics Amer	Electronics Corporation of America
Emerson Electric	Emerson Electric Co.

Esso Research + Eng.	Esso Research and Engineering Co.
Ethyl	Ethyl Corporation
Europe Atom En Com	European Atomic Energy Community
Evans R+D	Evans Research and Development Corp
Excelco Develop	Excelco Development, Inc.
Experiment Incorp	Experiment Incorporated
Explosives R+D Est	Explosives Research and Development Establishment (U.K.)
Fairchild Cam+Inst	Fairchild Camera and Instrument Corporation
Fairchild Engine D	Fairchild Engine Division, Fairchild Engine and Airplane Corp.
Fairchild Stratos	Fairchild Stratos Corporation
Fansteel Metallurg	Fansteel Metallurgical Corporation
Fine Organics	Fine Organics, Inc., New York
Firestone Tire+Rub	Firestone Tire + Rubber Company
U Florida	University of Florida
Fluor	The Fluor Corporation
FMC	FMC Corporation
Food Machine+Chem	Food Machinery and Chemical Corp
For Tech Div Edw	Foreign Technology Division, Edwards AFB
For Tech Div WPAFB	Foreign Technology Division, Wright-Patterson AFB
Forest Products L	Forest Products Laboratory
Forest Service	Forest Service. U.S. Dept. of Agriculture
Fram	Fram Corporation, Providence, R.I.
Frank Inst Res Lab	The Franklin Institute Research Laboratory

Hercules Powder	Hercules Powder Company
Hexcel Products	Hexcel Products, Inc.
High Temp Material	High Termperature Materials, Inc.
Holloman Air Dev C	Holloman Air Development Center
Honeywell	Honeywell, Incorporated
Hooker Chemical	Hooker Chemical Corp.
Horizons	Horizons, Inc.
Houston Engineer	Houston Engineering Corporation
Houston Res Inst	Houston Research Institute, Inc.
Hughes Aircraft	Hughes Aircraft Corporation
Hughes-Fullerton	Hughes Aircraft Company, Fullerton
Hughes Research L	Hughes Research Laboratories
Hughes Tool	Hughes Tool Co.
Hycon Mfg	Hycon Mfg. Company
Hydro-Aire	Hydro-Aire Inc.
Hynes Chemical Res	Hynes Chemical Research Corp.
IBM/Elect Sys C	International Business Machines Corporation, Electronic Systems Center
U Illinois	University of Illinois
Illinois Inst Tech	Illinois Institute of Technology
Imperial Chemical	Imperial Chemical Industries Limited
Imperial Col Sci	Imperial College of Science and Technology (U.K.)
In Def Analyses	Institute for Defense Analyses
Ind Res Inst/UCHAT	Industrial Research Institute, University of Chattanooga
Indium Corp Amer	Indium Corporation of America

Gen Elect/Spacecr	General Electric Company, Spacecraft Department
Gen Elect/V Forge	General Electric Company, Valley Forge Space Technology
Gen Motors	General Motors Corporation
Gen Technologies	General Technologies Corporation
Gen Tel+Electron L	General Telephone and Electronics Lab.
General Kinetics	General Kinetics, Inc.
General Steel Ind	General Steel Industries, Inc.
Geophysics Res Dir	Geophysics Research Directorate (AFCRL)
Georgia Inst Tech	Georgia Institute of Technology
Goddard SFC (NASA)	Goddard Space Flight Center (NASA)
B F Goodrich	B. F. Goodrich Company
Goodyear Aerospace	Goodyear Aerospace Corporation
Goodyear Aircraft	Goodyear Aircraft Corporation
W R Grace	W. R. Grace and Company
Grand Central Rock	Grand Central Rocket Co.
Grumman Air Eng	Grumman Aircraft Engineering Corp.
Guggenheim Aero L	Guggenheim Aeronautical Laboratory
Guggenheim JPC	Guggenheim Jet Propulsion Center
H I Thomp Fiber Gl	H. I. Thompson Fiber Glass Company
Harry Diamond Labs	Harry Diamond Laboratories
Harshaw Chemical	The Harshaw Chemical Co.
Harvard U	Harvard University
Hayes Aircraft	Hayes Aircraft Corporation
Hefco Labs	Hefco Laboratories, Inc.
Hercules	Hercules Incorporated

Frankford Arsenal	Frankford Arsenal
Franklin Inst	Franklin Institute
Frebank	Frebank Company
Fund Method Assocs	Fundamental Methods Associates, Inc.
Garrett	The Garrett Corp
Garrett/Airesearch	The Garrett Corporation, Airesearch Manufacturing Co. Division
GC Marshall (NASA)	George C. Marshall Space Flight Center
Gen American Trans	General American Transportation Corp
Gen Applied Sci L	General Applied Science Laboratories
General Atomic	General Atomic Division, General Dynamics
Gen Dynamics/Astro	General Dynamics/Astronautics
Gen Dynamics/Conv	General Dynamics/Convair
Gen Dynamics/El B	General Dynamics Corporation Electric Boat Division
Gen Dynamics/Ft Wo	General Dynamics/Fort Worth
Gen Elect	General Electric Company
Gen Elect/Flight P	General Electric Company, Flight Propulsion Division
Gen Elect/Hanford	General Electric Co., Hanford Atomic Products Operation
Gen Elect/Missile	General Electric Company, Missile And Space Division
Gen Elect/Nucl En	General Electric Company, Nuclear Energy Division
Gen Elect/Nucl M+P	General Electric Company, Nuclear Materials and Propulsion Operation
Gen Elect R+D C	General Electric Research and Development Center
Gen Elect/Spa Sci	General Electric Company, Space Sciences Laboratory

Ingersoll-K/Borg W	Ingersoll Kalamazoo Division, Borg-Warner Corporation
Inst Environ Sci	Institute of Environmental Sciences
Institute Gas Tech	Institute of Gas Technology
Inter-Bur Tech Com	Inter-Bureau Technical Committee, Navy Dept.
Interagency CRPG	Interagency Chemical Rocket Propulsion Group
Intermountain R+E	Intermountain Research and Engineering Company, Inc.
Internat Nickel	The International Nickel Company, Inc.
Iowa State U Sci/T	Iowa State University of Science and Technology
ITT Research Inst	ITT Research Institute
J C Carter	J. C. Carter Company
J P Stevens	J. P. Stevens and Company, Inc.
Jet Prop C/Purdu U	Jet Propulsion Center, Purdue University
Jet Propulsion L	Jet Propulsion Laboratory, California Institute of Technology
Johns Hopkins U	Johns Hopkins University See Also: Chemical Propellant Information Agency, Applied Physics Lab.
Kaiser Aluminum	Kaiser Aluminum
U Kansas	University of Kansas
Kem-Tech Labs	Kem-Tech Laboratories, Inc.
Kennedy Indus Coat	Kennedy Industrial Coatings, Inc.
Koppers	Koppers Company, Inc.
Ladish	Ladish Company
Lamont Geol Observ	Lamont Geological Observatory

Langley Res (NASA)	Langley Research Center (NASA)
Lawrence Radiat L	Lawrence Radiation Lab, University of California
Leeds and Northrop	Leeds and Northrop Company
Lehigh U	Lehigh University
Lessells + Assocs	Lessells and Associates, Inc.
Lewis Res C (NASA)	Lewis Research Center (NASA)
Lexington Labs	Lexington Laboratories, Inc. Cambridge, Mass
Library of Cong	Library of Congress
Linde	Linde Company
Linde Air Prod	The Linde Air Products Company
Link Ord Div/GP	Link Ordnance Division, General Precision, Inc.
Liquid Prop Inf Ag	Liquid Propellant Information Agency, Applied Physics Laboratory, The Johns Hopkins University See Also: Chemical Propellant Information Agency
Liquid Rock Prop L	Liquid Rocket Propulsion Laboratory, Picatinny Arsenal
Litton Systems	Litton Systems Incorporated
Lockheed Aircraft	Lockheed Aircraft Corporation
Lockheed-Calif	Lockheed-California Company
Lockheed-Georgia	Lockheed-Georgia Company
Lockheed Mis+Space	Lockheed Missiles and Space Company
Lockheed-Prop	Lockheed Propulsion Company
Los Alamos Sci Lab	Los Alamos Scientific Laboratory
Louisiana State U	Louisiana State University
U Louvain	University of Louvain

Lovelace Fdn	Lovelace Foundation for Medical Education and Research
Loyola U/LA	Loyola University of Los Angeles
LTV Aerospace	LTV Aerospace Corporation
Lycoming/AVCO	Lycoming, Division of AVCO Corp.
M W Kellog	The M. W. Kellog Co.
Magna	Magna Corporation
Magna Products	Magna Products
Manlabs	Manlabs, Inc.
Manufacturing Lab	Manufacturing Laboratories, Inc.
Marquardt	The Marquardt Corporation
Marquardt Aircraft	Marquardt Aircraft Co.
Marquette U	Marquette University
Martin	The Martin Company
Martin-Marietta	Martin-Marietta Corporation
U Maryland	University of Maryland
Mass Inst of Tech	Massachusetts Institute of Technology
Materials Advis Bd	Materials Advisory Board
Materials Res Lab	Materials Research Laboratory, Inc.
Mathieson Chemical	Mathieson Chemical Corporation
McDonnell Aircraft	Mc Donnell Aircraft Corporation
McGill U	Mc Gill University
McGraw-Hill Book	Mc Graw-Hill Book Co., Inc.
Med Col Virginia	Medical College of Virginia
Mellon Institute	Mellon Institute
Melpar	Melpar, Incorporated

Metal Hydrides	Metal Hydrides Incorporated
Metalectro	Metalectro Corp.
MHD Research	MHD Research, Inc.
U Michigan	University of Michigan
Michigan State U	Michigan State University
Midwest Res Inst	Midwest Research Institute
Mine Safety Appli	Mine Safety Appliance Co., Gallery, Pa.
Ministry of Avi UK	Ministry of Aviation (U.K.)
Ministry of Def UK	Ministry of Defense (U.K.)
Ministry of Sup UK	Ministry of Supply (U.K.)
Minneapolis-Honey	Minneapolis-Honeywell Regulator Company
U Minnesota	University of Minnesota
Minnesota Min+Mfg	Minnesota Mining and Manufacturing Company
Miss State U	Mississippi State University
Monsanto Chemical	Monsanto Chemical Company
Monsanto Chemicals	Monsanto Chemical Ltd.
Monsanto Research	Monsanto Research Corporation
U Munich	University of Munich
Narmco Research+D	Narmco Research and Development
Nat Acad Sciences	National Academy of Sciences
Nat Adv Comm Aero	National Advisory Committee for Aeronautics See Also: National Aeronautics and Space Administration
Nat Aero+Spa Admin	National Aeronautics and Space Administration See Also: George C. Marshall Space Flight Center, Goddard Space Flight Center, Langley Research Center, Lewis Research Center

Nat Bur Standards	National Bureau of Standards
Nat Cash Register	National Cash Register Co.
Nat Engineering Sc	National Engineering Science Company
Nat Gas Turbine Es	National Gas Turbine Establishment (U.K.)
National Beryllia	National Beryllia Corporation
National Carbon	National Carbon Company
National Research	National Research Corporation
Naval Air Devel C	Naval Air Development Center
Naval Air Mat C	Naval Air Material Center
Naval Air Mis TC	Naval Air Missile Test Center
Naval Air Rock TS	Naval Air Rocket Test Station
Naval Air Test C	Naval Air Test Center
Naval Eng Exper S	Naval Engineering Experiment Station
Naval Gun Factory	Naval Gun Factory
Naval Missile C	Naval Missile Center
Naval Ordnance Lab	Naval Ordnance Laboratory
Naval Ordnance Sta	Naval Ordnance Station
Naval Ordnance TS	Naval Ordnance Test Station
Naval Powder Fact	Naval Powder Factory
Naval Propellent P	Naval Propellant Plant
Naval Proving Grd	Naval Proving Ground, Dahlgren, Va.
Naval Rad Def Lab	Naval Radiological Defense Laboratory
Naval Research Lab	Naval Research Laboratory
Naval Torpedo S	Naval Torpedo Station
Naval Under Ord S	Naval Underwater Ordnance Station
Naval Weapons Lab	Naval Weapons Laboratory

New Eng Mat Lab	New England Materials Laboratory, Inc.
U New Mexico	University of New Mexico
New York Nav Ship	New York Naval Shipyard
New York U	New York University
Newark College Eng	Newark College of Engineering
Newmark Hans et al	Newmark, Hansen and Associates
North Am Aviation	North American Aviation, Inc. See Also: Atomics International Rocketdyne
North Atlantic Cl	North Atlantic Council
North Atlantic T O	North Atlantic Treaty Organization
North Carolina Col	North Carolina College
U North Dakota	University of North Dakota
Northern Ordnance	Northern Ordnance Incorporated
Northern Res+Eng	Northern Research and Engineering Corporation
Northrop	Northrop Corporation
Northrop Carolina	Northrop Carolina, Incorporated
Northrop Norair	Northrop Norair, A Division of Northrop Corporation
Northrop Space Lab	Northrop Space Laboratories
Northwestern U	Northwestern University
U Notre Dame	University of Notre Dame
Nuclear Util Serv	Nuclear Utility Services, Inc.
Nuclionics	Nuclionics
Oak Ridge Nat Lab	Oak Ridge National Laboratory
Off Aerospace Res	Office of Aerospace Research
Off Chief Naval Op	Office of the Chief of Naval Operations

Office Nav Res	Office of Naval Research, Washington
Office Nav Res/Lon	Office of Naval Research, London
Office Naval Intel	Office of Naval Intelligence
Ohio State U	Ohio State University
Ohio State U Res F	Ohio State University Research Foundation
Olin Industries	Olin Industries, Inc.
Olin Mathieson	Olin Mathieson Chemical Corp.
Operat Anal Of/SAC	Operations Analysis Office, Strategic Air Command
Ordnance Corps	Ordnance Corps
Oregon State U	Oregon State University
Owens-Corning Fib	Owens-Corning Fiberglas Corp.
Ozark-Mahoning	Ozark-Mahoning Company
Packard-Bell Elect	Packard-Bell Electronics Corporation
Parker Aircraft	Parker Aircraft Company
Parsons	The Parsons Corporation
Peninsular Chemres	Peninsular Chemresearch Incorporated
Penn Salt Mfg	Pennsylvania Salt Manufacturing Company
Pennsalt Chemicals	Pennsalt Chemicals Corporation
U Pennsylvania	University of Pennsylvania
Pennsylvania State	Pennsylvania State University
Perkin-Elmer	The Perkin-Elmer Corporation
Pesco Prod/Borg-W	Pesco Products Division, Borg-Warner Corporation
Philco	Philco Corporation
Philco-Ford	Philco-Ford Corporation

Phillips Petroleum	Phillips Petroleum Company
Picatinny Arsenal	Picatinny Arsenal See Also: Liquid Rocket Propulsion Laboratory
Picker X-ray	Picker X-ray Corporation
Planning Research	Planning Research Corporation
Plasmadyne	Plasmadyne Corporation
Plast Tech Eval C	Plastics Technical Evaluation Center
Polytech in Bklyn	Polytechnic Institute of Brooklyn
Potter Pacific	Potter Pacific Corporation
Pratt-Whitney AC	Pratt and Whitney Aircraft
Princeton U	Princeton University
Purdue Research Fn	Purdue Research Foundation
Purdue Research In	Purdue Research Institute
Purdue U	Purdue University See Also: Jet Propulsion Center
Pyrogenics	Pyrogenics, Inc.
Pyronetics	Pyronetics, Inc.
Quantum	Quantum, Inc.
Queens College	Queens College
Rad Effects Info C	Radiation Effects Information Center, Battelle Memorial Institute
RAI Research	RAI Research Corporation
Ramo-Woolridge	The Ramo-Woolridge Corporation
Rand	The Rand Corp
Raytheon	Raytheon Company
Raytheon Mfg	Raytheon Manufacturing Company

RCA/Def Elect Prod	Radio Corporation of America, Defense Electronic Products
RCA/Electro Comp+D	Radio Corporation of America, Electronic Components and Devices
RCA Laboratories	Radio Corporation of America Laboratories
	Reaction Motors Division See: Thiokol Chemical Corporation, Reaction Motors Division
Reaction Motors	Reaction Motors, Incorporated
Red Sci Info C	Redstone Scientific Information Center
Redel	Redel, Inc.
Redstone Arsenal	Redstone Arsenal, Army Missile Comand See Also: Army Rocket and Guided Missile Agency
Rensselaer Poly In	Rensselaer Polytechnic Institute
Republic Aviation	Republic Aviation Corp
Republic Steel	Republic Steel Corporation
Res+Tech Div/AFSC	Research and Technology Division, Air Force Systems Command
Research Chemicals	Research Chemicals
	Research Labs., United Aircraft Corp. See: United Aircraft Research Labs.
Research Mgt Assoc	Research Management Associates, Inc.
Resin Research L	Resin Research Laboratories, Inc.
Revere Laboratories	Revere Laboratories
U Rhode Island	University of Rhode Island
Rock Res L SSD Edw	Rocket Research Laboratory, Space Systems Division, Edwards AFB
Rocket Power	Rocket Power Incorporated
Rocket Prop Estab	Rocket Propulsion Establishment (U.K.)
Rocket Prop Lab	Rocket Propulsion Laboratory

Rocket Research	Rocket Research Corporation, Seattle
Rocketdyne/NAA	Rocketdyne, A Division of North American, Inc.
Rockwood Sprinkler	Rockwood Sprinkler Company
Rohm + Haas	Rohm and Haas Company
Rome Air Develop C	Rome Air Development Center
Royal Aircraft Est	Royal Aircraft Establishment (U.K.)
Royal Arm R+D Est	Royal Armament Research and Development Establishment (U.K.)
Saint Louis U	Saint Louis University
Sandia	Sandia Corporation
Sandia Lab	Sandia Laboratory, Albuquerque, N.M.
Sciaky Bros	Sciaky Bros. Inc.
Sharpley Labs	Sharpley Laboratories, Inc.
Shell Development	Shell Development Company
Soc Aero M+P Eng	Society of Aerospace Material and Process Engineers
Socony Mobil Oil	Socony Mobil Oil Company, Inc.
Solar	Solar
Solid Prop Info Ag	Solid Propellant Information Agency, Applied Physics Laboratory, The Johns Hopkins University See Also: Chemical Propulsion Information Agency
U Southern Calif	University of Southern California
Southern Method U	Southern Methodist University
Southern Res Inst	Southern Research Institute
Southwest Res Ins	Southwest Research Institute
Space-General	Space-General Corporation

Space Sys Div/AFSC	Space Systems Fivision, Air Force Systems Command
Space Sys Div Edw	Space Systems Division, Edwards AFB See Also: Rocket Research Laboratory
Space Technology L	Space Technology Laboratories
Sperry Products	Sperry Products, Inc.
Sperry Rand	Sperry Rand Corporation
Standard Oil/Ind	Standard Oil Company (Indiana)
Stanford Res Inst	Stanford Research Institute
Stanford U	Stanford University
Starnes	The Starnes Company
Stauffer-Aerojet	Stauffer-Aerojet Chemical Company
Stauffer-Chemical	Stauffer Chemical Company
Stevens Inst Tech	Stevens Institute of Technology
Strategic Air Comd	Strategic Air Command
Sundstrand Aviat	Sundstrand Aviation
Sundstrand Turbo	Sundstrand Turbo
Sunstrand Aviation	Sunstrand Aviation
Sylvania Elec Prod	Sylvania Electric Products, Inc.
Syracuse U	Syracuse University
Syracuse U Res In	Syracuse University Research Institute
Systems America	Systems Corporation of America
Systems Research L	Systems Research Laboratories, Inc.
Tapco/Thomp Ramo W	Tapco, Division of Thompson Ramo Wooldridge, Inc.
Tech Adv Pan F+L	Technical Advisory Panel on Fuels and Lubricants (Assistant Secretary of Defense (R+D)

Technical Operat	Technical Operations Incorporated
Technidyne	Technidyne, Incorporated
Technology	Technology, Incorporated
Tem-Press Research	Tem-Press Research, Inc.
Temple U Res Inst	Temple University, Research Institute
Tempo/Gen Elect	Tempo General Electric Company
Tennessee	Tennessee Corporation
U Tennessee	University of Tennessee
Texaco	Texaco Incorporated
Texaco Experiment	Texaco Experiment Incorporated
Texaco Research C	Texaco Research Center
Texas Instruments	Texas Instruments Incorporated
Texas Metal+Mfg	Texas Metal and Manufacturing Co.
U Texas	University of Texas
Thiokol Chem	Thiokol Chemical Corporation See Also: Reaction Motors Division
Thiokol Chem/Alph	Thiokol Chemical Corporation, Alpha Division
Thiokol Chem/Brist	Thiokol Chemical Corporation, Bristol Division
Thiokol Chem/Chem	Thiokol Chemical Corporation, Chemical Operations
Thiokol Chem/Elkto	Thiokol Chemical Corporation, Elkton Division
Thiokol Chem/Hunts	Thiokol Chemical Corporation, Huntsville Division
Thiokol Chem/Nucl	Thiokol Chemical Corporation, Nuclear Development Center
Thiokol Chem/React	Thiokol Chemical Corporation, Reaction Motors Division

Thiokol Chem/Red	Thiokol Chemical Corporation, Redstone Division
Thiokol/Rock	Thiokol Chemical Corporation, Rocket Operations Center
Thiokol Chem/Space	Thiokol Chemical Corporation, Space Booster Division
Thiokol Chem/Wasat	Thiokol Chemical Corporation, Wasatch Division
Thompson Products	Thompson Products, Inc.
Thompson Ramo Wool	Thompson Ramo Wooldridge, Inc. See Also: Tapco
Titanium Met Amer	Titanium Metals Corporation of America
U Toronto	University of Toronto
Tracerlab	Tracerlab
Transducer Info C	Transducer Information Center
Transp Tech Res In	Transportation Technical Research Institute (Tokyo)
TRG	TRG Incorporated
TRW	TRW Incorporated
TRW Space Tech Lab	TRW Space Technology Labs
TRW Systems	TRW Systems, Inc.
Tufts U	Tufts University
Tulane U	Tulane University
Tyco Labs	Tyco Laboratories, Inc.
Un Car Res Assoc	Union Carbide European Research Associates (Brussels)
Union Carbide	Union Carbide Corporation
Union Carbide Chem	Union Carbide Chemicals Company
Union Car Res Inst	Union Carbide Research Institute

Uniroyal	Uniroyal, Incorporated
United Aircraft	United Aircraft Corporation
United Aircraft/RL	United Aircraft Research Laboratories
United Technology	United Technology Corporation
UK Atomic Energy A	United Kingdom Atomic Energy Authority (U.K.)
Universal Chem Sys	Universal Chemical Systems, Inc.
Universal Match	Universal Match Corporation
Universal Oil Prod	Universal Oil Products Co.
URS	URS Corporation
	U.S. Atomic Energy Commission See: Atomic Energy Commission
	U.S. Forest Service See: Forest Service. U.S. Dept. of Agriculture
US Borax Research	U.S. Borax Research Corporation
US Industrial Chem	U.S. Industrial Chemicals Company
US Public Health S	United States Public Health Service
US Steel/App Res L	United States Steel Corporation, Applied Research Laboratory
US Stoneware	The United States Stoneware Company
U Utah	University of Utah
Value Engineering	Value Engineering Company
U Vermont	University of Vermont
Vidya/Itek	Vidya, Division of Itek Corporation
U Vienna	University of Vienna
U Virginia	University of Virginia
Visking	The Visking Corporation

Vitro Engineering	Vitro Engineering Company
Vitro Laboratories	Vitro Laboratories
Walter Kidde	Walter Kidde and Company
Warner + Swasey	The Warner and Swasey Company
U Washington	University of Washington
Watertown Arsenal	Watertown Arsenal
Welsbach	The Welsbach Corp.
Western Gear	Western Gear Corporation
Western Reserve U	Western Reserve University
Westinghouse Ast L	Westinghouse Astronuclear Laboratory
Westinghouse Elec	Westinghouse Electric Corporation
Westinghouse Res L	Westinghouse Research Laboratories
White Sands Prov G	White Sands Proving Ground
Willow Run Res C	Willow Run Research Center
U Wisconsin	University of Wisconsin
Wright Air Devel C	Wright Air Development Center
Wright Air Devel D	Wright Air Development Division
Wyandotte Chemicals	Wyandotte Chemical Corporation
Wyle	Wyle Laboratories
Young Development	Young Development Laboratories

2. CORPORATE SOURCE AUTHORITY LIST

Aberdeen Proving Ground	Aberdeen Prov Grd
Acoustica Associates	Acoustica Assocs
Ad Hoc Group on Solid-Propellant Instability of Combustion. Advisory Panel on Fuels and Lubricants	Advis Pan on Fuels
Ad Hoc Group on Solid-Propellant Instability of Combustion. Advisory Panel on Ordnance, Transport, and Su ply	Advis Pan on Ord
Adaptronics, Incorporated	Adaptronics
Admiralty Materials Laboratory (U.K.)	Adm Mat Lab UK
Advanced Metals Research Corp.	Adv Metals Res Lab
Advisory Group for Aeronautical Research and Development	Advis Grp Aero R+D
Aerochem Research Laboratories	Aerochem Res Lab
Aerojet Engineering Corp	Aerojet Eng
Aerojet-General Corporation, Advanced Systems	Aerojet-Gen/Adv Sy
Aerojet-General Corporation, Aerovessels Division	Aerojet-Gen/Aerov
Aerojet-General Corporation, Aetron-Covina Plant	Aerojet-Gen/Aetron
Aerojet-General Corporation, Astrionics	Aerojet-Gen/Astri
Aerojet-General Corporation, Azusa	Aerojet-Gen/AZU
Aerojet-General Corporation, Chemical Division	Aerojet-Gen/Chem
Aerojet-General Corporation, Liquid Rocket Plant	Aerojet-Gen/Liquid
Aerojet-General Corporation, Nucleonics	Aerojet-Gen/Nucl
Aerojet-General Corporation, Ordnance Division	Aerojet-Gen/Ord
Aerojet-General Corporation, REON Division	Aerojet-Gen/REON
Aerojet-General Corporation, Research Division	Aerojet-Gen/Res

Aerojet-General Corporation, Rocket Engine Operations - Nuclear	Aerojet-Gen/Rocket
Aerojet-General Corporation, Sacramento	Aerojet-Gen/Sacra
Aerojet-General Corporation, Solid Rocket Plant	Aerojet-Gen/Solid
Aerojet-General Corporation, Von Karman Center	Aerojet-Gen/VonKar
Aeronautical Research Associates of Princeton, Inc.	Aeron Res Assocs P
Aeronautical Research Council (U.K.)	Aeron Res C UK
Aeronautical Systems Division	Aeronautical Sys D
Aeronca Manufacturing Corp.	Aeronca Mfg.
Aeronutronic, Division of Ford Motor Co.	Aeronutronic/Ford
Aerophysics Development Corporation	Aerophysics Dev
Aeroprojects, Inc.	Aeroprojects
Aeroquip Corporation	Aeroquip
Aerospace Chemical Systems, Inc.	Aerospace Chem Sys
Aerospace Corp.	Aerospace
Aerospace Research Associates	Aero Res Assocs
Aerospace Research Laboratories	Aero Res Labs
Aerospace Technical Intelligence Center	Aero Tech Intel C
Air Force Aero Propulsion Laboratory	AF Aero Prop Lab
Air Force Aerospace Medical Research Labs	AF Aero Med Res L
Air Force Ballistic Missile Division	AF Ballis Mis Div
Air Force Flight Test Center	AF Flight Test C
Air Force Institute of Technology	AF Inst Technology
Air Force Logistics Command	AF Logistics Comd
Air Force Materials Laboratory	AF Materials Lab
Air Force Missile Development Center	AF Missile Devel C
Air Force Office of Scientific Research	AF Office Sci Res

Air Force Rocket Propulsion Laboratory	AF Rocket Prop Lab
Air Force Special Weapons Center	AF Spec Weapons C
Air Force Systems Command	AF Systems Comd
Air Force Weapons Laboratory	AF Weapons Lab
Air Materiel Command	Air Materiel Comd
Air Products, Inc	Air Products
Air Products and Chemicals, Inc.	Air Prod and Chem
Air Reduction Company, Inc.	Air Reduction
Air Research and Development Command	Air R+D Comd
Air Technical Intelligence Center	Air Tech Intell C
Air University	Air University
Airesearch Manufacturing Company, Division of the Garrett Corporation. See: The Garrett Corporation, Airesearch Manufacturing Co. Division	
Alcoa Research Laboratory	Alcoa Res Lab
Alcor, Inc.	Alcor
Allen B. Dumont Laboratories, Inc.	Allen B. Dumont L
Allied Chemical Corp.	Allied Chemical
Allied Chemical & Dye Corp.	Allied Chem + Dye
Allied Research Associates, Inc.	Allied Res Assocs
Allison Division of General Motors Corporation	Allison/GMC
Alloyd Electronics Corporation	Alloyed Electronics
Althea Revere, Vineyard Haven, Mass.	Althea Revere
Aluminum Company of America	Alum Co. America
Alluminum Research Laboratories	Aluminum Res Labs
Amcel Propulsion, Inc.	Amcel Propulsion
American Cyanamid Company	Am Cyanamid
American Machine and Foundry Corp.	Am Mach + Foundry

American Potash and Chemical Corp.	Am Potash and Chem
American Radiator and Standard Sanitary Corporation	Amer Rad + Std Sanit
American Reinforced Plastics Company	Amer Rein Plastics
American Society of Mechanical Engineers	Amer Soc Mech Eng
Analytic Services, Incorporated	Analytic Services
A. O. Smith Corp.	A O Smith
Applied Physics Lab., Johns Hopkins University	App Phys L J Hop U
Applied Science Laboratories, Inc.	Applied Science L
Arde Associates	Arde Associates
Argonne National Laboratory	Argonne National L
Armed Forces Special Weapons Project	Armed Forces SWP
Armed Services Explosives Safety Board	Arm Ser Explo Safe
Armed Services Technical Information Agency	ASTIA
Armour Research Foundation	Armour Res Fdn
Army Ballistic Missile Agency	Army Ballistic MA
Army Chemical Center	Army Chem Center
Army Library, Washington D.C.	Army Library
Army Materials Research Agency	Army Materials Res
Army Missile Command See: Redstone Arsenal	
Army Missile Test Center	Army Missile Tes/C
Army Rocket and Guided Missile Agency See Also: Redstone Arsenal	Army Rocket GMA
Arnold Engineering Development Center	Arnold Eng. Dev C
ARO, Inc.	ARO
Arthur D. Little, Inc.	Arthur D. Little
Ashland Oil and Refining Company	Ashland Oil + Ref

Astro, a division of the Marguardt orp.	ASTRO
Astrodyne, Incorporated	Astrodyne
Astropower, Inc.	Astropower
Astrosystems International, Inc.	Astrosystems Int
Atlantic Research Corp.	Atlantic Research
Atomic Energy Commission	Atomic En Com
Atomic Energy Commission, Division of Technical Information	Atom En Com/DTI
Atomic Weapons Research Establishment	Atom Weap Res Est
Atomics International, North American Aviation	Atomics Int/NAA
Auburn University	Auburn U
Automation Industries, Inc.	Automation Ind.
Autometric Corporation	Autometric
AVCO Corporation See Also: Lycoming Division	AVCO
AVCO-Everett Research Laboratory	AVCO-Everett Res L
Babcock and Wilcox Co., Research Center	Babcock Wilcox Res
Ballistic Research Laboratories	Ballistic Res Lab
Ballistic Systems Division	Ballistic Sys Div
Battelle Memorial Institute See Also: Defense Metals Information Center Radiation Effects Information Center	Battelle Memorial
Battelle-Northwest (Pacific Northwest Laboratory operated by Battelle)	Battelle-Northwest
Becco Chemical Division, Food Machinery and Chemical Corp.	Becco Chemical/FMC
Beech Aircraft Corporation	Beech Aircraft
Beechcraft Research and Development	Beechcraft R+D
Bell Aerosystems Company	Bell Aerosystems
Bell Aircraft Corporation	Bell Aircraft

Bendix Aviation Corporation	Bendix Aviation
The Bendix Corporation	Bendix
Bermite Powder Company	Bermite Powder
The Beryllium Corporation	Beryllium
Bethlehem Steel Co.	Bethlehem Steel
Bettis Atomic Power Laboratory, Pittsburgh, Pa.	Bettis Atomic Pow L
Bjorksten Research Laboratories, Inc.	Bjorksten Res Lab
The Boeing Company	Boeing
Bolt Beranek and Newman, Inc.	Bolt Beranek et al
Booz, Allen & Hamilton	Booz Allen + Ham
Borg-Warner Corporation See also: Pesco Products Division	Borg-Warner
University of British Columbia	U British Columbia
The British Oxygen Co.	British Oxygen
Brown University	Brown U
Brunswick Corp.	Brunswick
Brush Beryllium Company	Brush Beryllium
University of Brussels	U Brussels
Bucyrus-Erie Company	Bucyrus-Erie
Buffalo Electro-Chemical Company, Inc.	Buffalo Elect-Chem
University of Buffalo	U of Buffalo
Building Research Station, Watford, England	Building Res Sta
Bureau of Aeronautics	Bureau Aeronautics
Bureau of Mines	Bureau of Mines
Bureau of Ships	Bureau of Ships
California Institute of Technology See Also: Jet Propulsion Laboratory Guggenheim Aeronautical Labs Guggenheim Jet Propulsion Center	Calif Inst of Tech

California Research Corp.	California Res
University of California	U California
University of California at Los Angeles	U California L A
Callery Chemical Company	Callery Chemical
Cambridge Corporation	Cambridge
Canadian Armament Research and Development Establishment	Canadian Arm R+D
Canadian Research and Development Establishment	Canadian R+D Estab
Carborundum Company	Carborundum
Carnegie Institute of Technology	Carnegie Inst Tech
Case Institute of Technology	Case Inst Tech
Catholic University of America	Catholic U America
Celestial Research Corp.	Celestial Research
Century Engineers Inc.	Century Engineers
Chance Vought Corporation	Chance Vought
Chemical Defense Experimental Establishment (U.K.)	Chem Def Exp Est
Chemical Propulsion Information Agency. Johns Hopkins University. See Also: Liquid Propellant Information Agency Solid Propellant Information Agency	Chem Prop Info Ag
Chicago Aerial Industries, Inc.	Chicago Aerial Ind
University of Chicago	U Chicago
Chrysler Corporation	Chrysler
University of Cincinnati	U Cincinnati
Clemson College	Clemson College
Cleveland Industrial Research, Inc.	Cleveland Ind Res
Clevite Corporation	Clevite
Climax Molybdenum Company of Michigan	Climax Molyb/Mich
Coated Textile Mills, Inc.	Coated Text Mills

College of Aeronautics (U.K.)	College of Aero UK
College Placement Council, Inc.	College Place Coun
Colorado School of Mines Research Foundation	Colo Sch Mines RF
University of Colorado	U Colorado
Columbia Radiation Laboratory	Columbia Radiat L
Combustion and Explosives Research, Inc.	Combust + Explos Res
Commerical Solvents Corporation	Commercial Solvent
Committee on Fuels and Lubricants, Research Development Board	Comm Fuels + Lub
Committee on Undersea Warfare, National Research Council	Comm Under Warfare
Compo Tek Inc., Palo Alto	Compo Tek
Conesco, Inc.	Conesco
Connecticut Hard Rubber Company	Conn Hard Rubber
Convair Astronautics See also: General Dynamics/Convair	Convair Astro
Convair, Fort Worth	Convair/Ft Worth
Convair, Thermodynamics Laboratory	Convair/Thermo L
Coordinating Research Council, Inc.	Coordinating Res C
University of Copenhagen	U Copenhagen
Cornell Aeronautical Laboratory, Inc.	Cornell Aeron Lab
Cornell University	Cornell U
Cosmodyne Corporation	Cosmodyne
Curtiss-Wright Corporation	Curtiss-Wright
Daniel, Mann, Johnson, and Mendenhall	Daniel Mann et al
University of Dayton	U Dayton
University of Dayton Research Institute	U Dayton Res Inst
Debell and Richardson, Inc.	Debell + Richardson

Defense Documentation Center	Defense Document C
Defense Metals Information Center	Def Metals Info C
Defense Research Corporation	Defense Research
Defense Research Laboratories	Defense Research L
University of Delaware	U Delaware
University of Denver	U Denver
Denver Research Institute	Denver Research In
Department of the Air Force	Dept Air Force
Department of Defense, Washington D.C.	Dept of Defense
Diamond Alkali Company	Diamond Alkali
Directorate of Advanced Systems Technology	Dir Advanced Sys T
Directorate of Aerospace Safety	Dir Aerospace Saf
Directorate of Rocket Propulsion and Missiles	Dir Rock Prop+Mis
Douglas Aircraft Company, Inc.	Douglas Aircraft
The Dow Chemical Company	Dow Chemical
Dow Corning Corporation	Dow Corning
University of Durham	U Durham
Dynamic Science Corporation	Dynamic Science
Dynatech Corporation	Dynatech
E. H. Sargent & Co.	E H Sargent
E. I. Du Pont de Nemours and Company	E I Du Pont de Nem
Edgewood Arsenal	Edgewood Arsenal
The Edwal Laboratories, Inc.	Edwal Labs
Electro Jet Corporation	Electro Jet
Electro-Mechanical Laboratory	Electro-Mech Lab
Electro Optical Systems, Inc.	Electro Optical Sy

Electro-Thermal Indsutries, Inc.	Electro-Therm Inds
Electronic Systems Development Corp	Electronic Sys Dev
Electronics Corporation of America	Electronics Amer
Emerson Electric Co.	Emerson Electric
Esso Research and Engineering Co.	Esso Research+Eng
Ethyl Corporation	Ethyl
European Atomic Energy Community	Europe Atom En Com
Evans Research and Development Corp	Evans R+D
Excelco Development, Inc.	Excelco Develop
Experiment Incorporated	Experiment Incorp
Explosives Research and Development Establishment (U.K.)	Explosives R+D Est
Fairchild Camera and Instrument Corporation	Fairchild Cam+Inst
Fairchild Engine Division, Fairchild Engine and Airplane Corp.	Fairchild Engine D
Fairchild Stratos Corporation	Fairchild Stratos
Fansteel Metallurgical Corporation	Fansteel Metallurg
Fine Organics, Inc., New York	Fine Organics
Firestone Tire & Rubber Company	Firestone Tire+Rub
University of Florida	U. Florida
The Fluor Corporation	Fluor
FMC Corporation	FMC
Food Machinery and Chemical Corp.	Food Machine+Chem
Foreign Technology Division, Edwards AFB	For Tech Div Edw
Foreign Technology Division, Wright-Patterson AFB	For Tech Div WPAFB
Forest Products Laboratory	Forest Products L
Forest Service. U.S. Dept. of Agriculture	Forest Service

Fram Corporation, Providence, R. I.	Fram
Frankford Arsenal	Frankford Arsenal
Franklin Institute	Franklin Inst
The Franklin Institute Research Laboratories	Frank Inst Res Lab
Frebank Company	Frebank
Fundamental Methods Associates, Inc.	Fund Method Assocs
The Garrett Corp	Garrett
The Garrett Corporation, Airesearch Manufacturing Co. Division	Garrett/Airesearch
General American Transportation Corp.	Gen American Trans
General Applied Science Laboratories	Gen Applies Sci L
General Atomic Division, General Dynamics	General Atomic
General Dynamics/Astronautics	Gen Dynamics/Astro
General Dynamics/Convair	Gen Dynamics/Conv
General Dynamics Corporation Electric Boat Division	Gen Dynamics/El Bo
General Dynamics/Fort Worth	Gen Dynamics/Ft Wo
General Electric Company	Gen Elect
General Electric Company, Flight Propulsion Division	Gen Elect/Flight P
General Electric Co, Hanford Atomic Products Operation	Gen Elect/Hanford
General Electric Company, Missile and Space Division	Gen Elect/Missile
General Electric Company, Nuclear Energy Division	Gen Elect/Nucl En
General Electric Company, Nuclear Materials and Propulsion Operation	Gen Elect/Nucl M+P
General Electric Research and Development Center	Gen Elect R+D C
General Electric Company, Space Sciences Laboratory	Gen Elect/Spa Sci

General Electric Company, Spacecraft Department	Gen Elect/Spacecr
General Electric Company, Valley Forge Space Technology	Gen Elect/V Forge
General Kinetics, Inc.	General Kinetics
General Motors Corporation	Gen Motors
General Steel Industries, Inc.	General Steel Ind
General Technologies Corporation	Gen Technologies
General Telephone and Electronics Lab	Gen Tel+Electron L
Geophysics Research Directorate (AFCRL)	Geophysics Res Dir
George C. Marshall Space Flight Center	GC Marshall (NASA)
Georgia Institute of Technology	Georgia Inst. Tech
Goddard Space Flight Center (NASA)	Goddard SFC (NASA)
B. F. Goodrich Company	B F Goodrich
Goodyear Aerospace Corporation	Goodyear Aerospace
Goodyear Aircraft Corporation	Goodyear Aircraft
W. R. Grace and Company	W R Grace
Grand Central Rocket Co.	Grand Central Rock
Grumman Aircraft Engineering Corp.	Grumman Air Eng
Guggenheim Aeronautical Laboratory	Guggenheim Aero L
Guggenheim Jet Propulsion Center	Guggenheim JPC
H. I. Thompson Fiber Glass Company	H I Thomp Fiber Gl
Harry Diamond Laboratories	Harry Diamond Labs
The Harshaw Chemical Co.	Harshaw Chemical
Harvard University	Harvard U
Hayes Aircraft Corporation	Hayes Aircraft
Hefco Laboratories, Inc.	Hefco Labs
Hercules Incorporated	Hercules

Hercules Powder Company	Hercules Powder
Hexcel Products, Inc.	Hexcel Products
High Temperature Materials, Inc.	High Temp Material
Holloman Air Development Center	Holloman Air Dev C
Honeywell, Incorporated	Honeywell
Hooker Chemical Corp.	Hooker Chemical
Horizons, Inc.	Horizons
Houston Engineering Corporation	Houston Engineer
Houston Research Institute, Inc.	Houston Res Inst
Hughes Aircraft Company, Fullerton	Hughes-Fullerton
Hughes Aircraft Corporation	Hughes Aircraft
Hughes Research Laboratories	Hughes Research L
Hughes Tool Co.	Hughes Tool
Hycon Mfg. Company	Hycon Mfg
Hydro-Aire Inc	Hydro-Aire
Hynes Chemical Research Corp.	Hynes Chemical Res
University of Illinois	U Illinois
Illinois Institute of Technology	Illinois Inst Tech
Imperial Chemical Industries Limited	Imperial Chemical
Imperial College of Science and Technology (U.K.)	Imperial Col Sci
Indium Corporation of America	Indium Corp Amer
Industrial Research Institute, University of Chattanooga	Ind Res Inst/UCHAT
Ingersoll Kalamazoo Division, Borg-Warner Corporation	Ingersoll-K/Borg W
Institute for Defense Analyses	In Def Analyses
Institute of Environmental Sciences	Inst Environ Sci
Institute of Gas Technology	Institute Gas Tech

Inter-Bureau Technical Committee, Navy Dept.	Inter-Bur Tech Com
Interagency Chemical Rocket Propulsion Group	Interagency CRPG
Intermountain Research and Engineering Company, Inc.	Intermountain R+E
International Business Machines Corporation Electronic Systems Center	IBM/Elect Sys C
The International Nickel Company, Inc.	Internat Nickel
Iowa State University of Science and Technology	Iowa State U Sci/T
ITT Research Institute	ITT Research Inst
J. C. Carter Company	J C Carter
J. P. Stevens and Company, Inc.	J P Stevens
Jet Propulsion Center, Purdue University	Jet Prop C/Purdu U
Jet Propulsion Laboratory, California Institute of Technology	Jet Propulsion L
Johns Hopkins University See Also: Chemical Propellant Information Agency Applied Physics Lab	Johns hopkins U
Kaiser Aluminum	Kaiser Aluminum
University of Kansas	U Kansas
Kem-Tech Laboratories, Inc.	Kem-Tech Labs
Kennedy Industrial Coatings, Inc.	Kennedy Indus Coat
Koppers Company, Inc.	Koppers
Ladish Company	Ladish
Lamont Geological Observatory	Lamont Geol Observ
Langley Research Center (NASA)	Langley Res (NASA)
Lawrence Radiation Lab, University of California	Lawrence Radiat L
Leeds and Northrop Company	Leeds and Northrop
Lehigh University	Lehigh U
Lessells and Associates, Inc.	Lessells+Assocs
Lewis Research Center (NASA)	Lewis Res C (NASA)

Lexington Laboratories, Inc. Cambridge, Mass.	Lexington Labs
Library of Congress	Library of Cong
The Linde Air Products Company	Linde Air Prod
Linde Company	Linde
Link Ordnance Division, General Precision, Inc.	Link Ord Div/GP
Liquid Propellant Information Agency Applied Physics Laboratory, The Johns Hopkins University See Also: Chemical Propellant Information Agency	Liquid Prop Inf Ag
Liquid Rocket Propulsion Laboratory, Picatinny Arsenal	Liquid Rock Prop L
Litton Systems Incorporated	Litton Systems
Lockheed Aircraft Corporation	Lockheed Aircraft
Lockheed-California Company	Lockheed-Calif
Lockheed-Georgia Company	Lockheed-Georgia
Lockheed Missiles and Space Company	Lockheed Mis+Space
Lockheed Propulsion Company	Lockheed-Prop
Los Alamos Scientific Laboratory	Los Alamos Sci L
Louisiana State University	Louisiana State U
University of Louvain	U Louvain
Lovelace Foundation for Medical Education and Research	Lovelace Fdn
Loyola University of Los Angeles	Loyola U/LA
LTV Aerospace Corporation	LTV Aerospace
Lycoming, Division of AVCO Corp.	Lycoming/AVCO
The M. W. Kellog Co.	M W Kellog
Magna Corporation	Magna
Magna Products	Magna Products
Manlabs, Inc.	Manlabs

Manufacturing Laboratories, Inc.	Manufacturing Lab
Marquardt Aircraft Co.	Marquardt Aircraft
The Marquardt Corporation	Marquardt
Marquette University	Marquette U
The Martin Company	Martin
Martin-Marietta Corporation	Martin-Marietta
University of Maryland	U Maryland
Massachusetts Institute of Technology	Mass Inst of Tech
Materials Advisory Board	Materials Advis Bd
Materials Research Laboratory, Inc.	Materials Res Lab
Mathieson Chemical Corporation	Mathieson Chemical
McDonnell Aircraft Corporation	McDonnell Aircraft
McGill University	McGill U
McGraw-Hill Book Co., Inc.	McGraw-Hill Book
Medical College of Virginia	Med Col Virginia
Mellon Institute	Mellon Institute
Melpar, Incorporated	Melpar
Metal Hydrides Incorporated	Metal Hydrides
Metalectro Corps.	Metalectro
MHD Research, Inc.	MHD Research
University of Michigan	U Michigan
Michigan State University	Michigan State U
Midwest Research Institute	Midwest Res Inst
Mine Safety Appliances Co., Callery, Pa.	Mine Safety Appli
Ministry of Aviation (U.K.)	Ministry of Avi UK
Ministry of Defense (U.K.)	Ministry of Def UK
Ministry of Supply (U.K.)	Ministry of Sup UK

Minneapolis-Honeywell Regulator Company	Minneapolis-Honey
University of Minnesota	U Minnesota
Minnesota Mining and Manufacturing Co.	Minnesota Min+Mfg
Mississippi State University	Miss State U
Monsanto Chemical Company	Monsanto Chemical
Monsanto Chemicals Ltd.	Monsanto Chemicals
Monsanto Research Corporation	Monsanto Research
University of Munich	U Munich
Narmco Research and Development	Narmco Research+D
National Academy of Sciences	Nat Acad Sciences
National Advisory Committee for Aeronautics See Also: National Aeronautics and Space Administration	Nat Adv Comm Aero
National Aeronautics and Space Administration See Also: George C. Marshall Space Flight Center, Goddard Space Flight Center Langley Research Center Lewis Research Center	Nat Aero+Spa Admin
National Beryllia Corporation	National Beryllia
National Bureau of Standards	Nat Bur Standards
National Carbon Company	National Carbon
National Cash Register Co.	Nat Cash Register
National Engineering Science Company	Nat Engineering Sc
National Gas Turbine Establishment (U.K.)	Nat Gas Turbine Es
National Research Corporation	National Research
Naval Air Development Center	Naval Air Devel C
Naval Air Material Center	Naval Air Mat C
Naval Air Missile Test Center	Naval Air Mis TC
Naval Air Rocket Test Station	Naval Air Rock TS
Naval Air Test Center	Naval Air Test C

Naval Engineering Experiment Station	Naval Eng Exper S
Naval Gun Factory	Naval Gun Factory
Naval Missile Center	Naval Missile C
Naval Ordnance Laboratory	Naval Ordnance Lab
Naval Ordnance Station	Naval Ordnance Sta
Naval Ordnance Test Station	Naval Ordnance TS
Naval Powder Factory	Naval Powder Fact
Naval Propellant Plant	Naval Propellant P
Naval Proving Ground, Dahlgren, Va.	Naval Proving Grd
Naval Radiological Defense Laboratory	Naval Rad Def Lab
Naval Research Laboratory	Naval Research Lab
Naval Torpedo Station	Naval Torpedo S
Naval Underwater Ordnance Station	Naval Under Ord S
Naval Weapons Laboratory	Naval Weapons Lab
New England Materials Laboratory, Inc.	New Eng Mat Lab
University of New Mexico	U New Mexico
New York Naval Shipyard	New York Nav Ship
New York University	New York U
Newark College of Engineering	Newark College Eng
Newmark, Hansen and Associates	Newmark Hans et al
North American Aviation, Inc. See Also: Atomics International Rocketdyne	North Am Aviation
North Atlantic Council	North Atlantic Cl
North Atlantic Treaty Organization	North Atlantic T O
North Carolina College	North Carolina Col
University of North Dakota	U North Dakota
Northern Ordnance Incorporated	Northern Ordnance

Northern Research and Engineering Corporation	Northern Res+Eng
Northrop Carolina, Incorporated	Northrop Carolina
Northrop Corporation	Northrop
Northrop Norair, A Division of Northrop Corporation	Northrop Norair
Northrop Space Laboratories	Northrop Space Lab
Northwestern University	Northwestern U
University of Notre Dame	U Notre Dame
Nuclear Utility Services, Inc.	Nuclear Util Serv
Nuclionics	Nuclionics
Oak Ridge National Laboratory	Oak Ridge Nat Lab
Office of Aerospace Research	Off Aerospace Res
Office of Naval Intelligence	Office Naval Intel
Office of Naval Research, Washington	Office Nav Res
Office of Naval Research, London	Office Nav Res/Lon
Office of the Assistant Secretary of Defense (Research and Development)	Assist Sec Def R+D
Office of the Assistant Secretary of Defense (Supply and Logistics)	Assist Sec Def S+L
Office of the Chief of Naval Operations	Off Chief Naval Op
Ohio State University	Ohio State U
Ohio State University Research Foundation	Ohio State U Res F
Olin Industries, Inc.	Olin Industries
Olin Mathieson Chemical Corp.	Olin Mathieson
Operations Analysis Office, Strategic Air Command	Operat Anal Of/SAC
Ordnance Corps	Ordnance Corps
Oregon State University	Oregon State U
Owens-Corning Fiberglas Corp.	Owens-Corning Fib

Ozark-Mahoning Company	Ozark-Mahoning
Packard-Bell Electronics Corporation	Packard-Bell Elect
Parker Aircraft Company	Parker Aircraft
The Parsons Corporation	Parsons
Peninsular Chemresearch Incorporated	Peninsular Chemres
Pennsalt Chemicals Corporation	Pennsalt Chemicals
University of Pennsylvania	U Pennsylvania
Pennsylvania Salt Manufacturing Company	Penn Salt Mfg
Pennsylvania State University	Pennsylvania State
The Perkin-Elmer Corporation	Perkin-Elmer
Pesco Products Division, Borg-Warner Corporation	Pesco Prod/Borg-W
Philco Corporation	Philco
Philco-Ford Corporation	Philco-Ford
Phillips Petroleum Company	Phillips Petroleum
Picatinny Arsenal See Also: Liquid Rocket Propulsion Laboratory	Picatinny Arsenal
Picker X-ray Corporation	Picker X-ray
Planning Research Corporation	Planning Research
Plasmadyne Corporation	Plasmadyne
Plastics Technical Evaluation Center	Plast Tech Eval C
Polytechnic Institute of Brooklyn	Polytech In Bklyn
Potter Pacific Corporation	Potter Pacific
Pratt and Whitney Aircraft	Pratt-Whitney AC
Princeton University	Princeton U
Purdue Research Foundation	Purdue Research Fn
Purdue Research Institute	Purdue Research In

Purdue University See Also: Jet Propulsion Center	Purdue U
Pyrogenics, Inc.	Pyrogenics
Pyronetics, Inc.	Pyronetics
Quantum, Inc.	Quantum
Queens College	Queens College
Radiation Effects Information Center, Battelle Memorial Institute	Rad Effects Info C
Radio Corporation of America, Defense Electronic Products	RCA/Def Elect Prod
Radio Corporation of America. Electronic Components and Devices	RCA/Electro Comp+D
Radio Corporation of America Laboratories	RCA Laboratories
RAI Research Corporation	RAI Research
The Ramo-Woolridge Corporation	Ramo-Woolridge
The Rand Corp.	Rand
Raytheon Company	Raytheon
Raytheon Manufacturing Company	Raytheon Mfg.
Reaction Motors Division See: Thiokol Chemical Corporation, Reaction Motors Division	
Reaction Motors, Incorporated	Reaction Motors
Redel, Inc.	Redel
Redstone Arsenal, Army Missile Command See Also: Army Rocket and Guided Missile Agency	Redstone Arsenal
Redstone Scientific Information Center	Red Sci Info C
Rensselaer Polytechnic Institute	Rensselaer Poly In
Republic Aviation Corp	Republic Aviation
Republic Steel Corporation	Republic Steel
Research Chemicals	Research Chemicals

Research Labs., United Aircraft Corp. See: United Aircraft Research Labs.	
Research Management Associates, Inc.	Research Mgt Assoc
Research and Technology Division Air Force Systems Command	Res+Tech Div/AFSC
Resin Research Laboratories, Inc.	Resin Research L
Revere Laboratories	Revere Laboratories
University of Rhode Island	U Rhode Island
Rocket Power Incorporated	Rocket Power
Rocket Propulsion Establishment (U.K.)	Rocket Prop Estab
Rocket Propulsion Laboratory	Rocket Prop Lab
Rocketdyne, A Division of North American, Inc.	Rocketdyne/NAA
Rocket Research Corporation, Seattle	Rocket Research
Rocket Research Laboratory, Sapce Systems Division, Edwards AFB	Rocket Res L SSD Edw
Rockwood Sprinkler Company	Rockwood Sprinkler
Rohm and Haas Company	Rohm + Haas
Rome Air Development Center	Rome Air Develop C
Royal Aircraft Establishment (U.K.)	Royal Aircraft Est
Royal Armament Research and Development Establishment (U.K.)	Royal Arm R+D Est
Saint Louis University	Saint Louis U
Sandia Corporation	Sandia
Sandia Laboratory, Albuquerque, N.M.	Sandia Lab
Sciaky Bros. Inc.	Sciaky Bros
Sharpley Laboratories, Inc.	Sharpley Labs
Shell Development Company	Shell Development
Society of Aerospace Material + Process Engineers	Soc Aero M+P Eng

Socony Mobil Oil Company, Inc.	Socony Mobil Oil
Solar	Solar
Solid Propellant Information Agency, Applied Physics Laboratory, The Johns Hopkins University See Also: Chemical Propulsion Information Agency	Solid Prop Info Ag
University of Southern California	U Southern Calif
Southern Methodist University	Southern Method U
Southern Research Institute	Southern Res Inst
Southwest Research Institute	Southwest Res Ins
Space-General Corporation	Space-General
Space Systems Division, Air Force Systems Command	Space Sys Div/AFSC
Space Systems Division, Edwards AFB See Also: Rocket Research Laboratory	Space Sys Div Edw
Space Technology Laboratories	Space Technology L
Sperry Products, Inc.	Sperry Products
Sperry Rand Corporation	Sperry Rand
Standard Oil Company (Indiana)	Standard Oil/Ind
Stanford Research Institute	Stanford Res Inst
Stanford University	Stanford U
The Starnes Company	Starnes
Stauffer-Aerojet Chemical Company	Stauffer-Aerojet
Stauffer Chemical Company	Stauffer-Chemical
Stevens Institute of Technology	Stevens Inst Tech
Strategic Air Command	Strategic Air Comd
Sundstrand Aviation	Sundstrand Aviat
Sundstrand Turbo	Sundstrand Turbo
Sunstrand Aviation	Sunstrand Aviation

Sylvania Electric Products, Inc.	Sylvania Elec Prod
Syracuse University	Syracuse U
Syracuse University Research Institute	Syracuse U Res In
Systems Corporation of America	Systems America
Systems Research Laboratories, Inc.	Systems Research L
Tapco, Division of Thompson Ramo Wooldridge, Inc.	Tapco/Thomp Ramo W
Technical Advisory Panel on Fuels and Lubricants (Assistant Secretary of Defense (R+D)	Tech Adv Pan F+L
Technical Operations Incorporated	Technical Operat
Technidyne, Incorporated	Technidyne
Technology, Incorporated	Technology
Tem-Press Research, Inc.	Tem-Press Research
Temple University, Research Institute	Temple U Res Inst
Tempo General Electric Company	Tempo/Gen Elect
Tennessee Corporation	Tennessee
University of Tennessee	U Tennessee
Texaco Experiment Incorporated	Texaco Experiment
Texaco Incorporated	Texaco
Texaco Research Center	Texaco Research C
Texas Instruments Incorporated	Texas Instruments
Texas Metal and Manufacturing Co.	Texas Metal+Mfg
University of Texas	U Texas
Thiokol Chemical Corporation See Also: Reaction Motors Division	Thiokol Chem
Thiokol Chemical Corporation, Alpha Division	Thiokol Chem/Alph
Thiokol Chemical Corporation, Bristol Division	Thiokol Chem/Brist
Thiokol Chemical Corporation, Chemical Operations	Thiokol Chem/Chem

Thiokol Chemical Corporation, Elkton Division	Thiokol Chem/Elkto
Thiokol Chemical Corporation, Huntsville Division	Thiokol Chem/Hunts
Thiokol Chemical Corporation, Nuclear Development Center	Thiokol Chem/Nucl
Thiokol Chemical Corporation, Reaction Motors Division	Thiokol Chem/React
Thiokol Chemical Corporation, Redstone Division	Thiokol Chem/Red
Thiokol Chemical Corporation, Rocket Operations Center	Thiokol Chem/Rock
Thiokol Chemical Corporation, Space Booster Division	Thiokol Chem/Space
Thiokol Chemical Corporation, Wasatch Division	Thiokol Chem/Wasat
Thompson Products, Inc.	Thompson Products
Thompson Ramo Wooldridge, Inc. See Also: Tapco	Thompson Ramo Wool
Titanium Metals Corporation of America	Titanium Met Amer
University of Toronto	U Toronto
Tracerlab	Tracerlab
Transducer Information Center	Transducer Info C
Transportation Technical Research Institute (Tokyo)	Transp Tech Res In
Trg Incorporated	TRG
TRW Incorporated	TRW
TRW Space Technology Labs	TRW Space Tech Lab
TRW Systems, Inc.	TRW Systems
Tufts University	Tufts U
Tulane University	Tulane U
Tyco Laboratories, Inc.	Tyco Labs
Union Carbide Chemicals Company	Union Carbide Chem

Union Carbide Corporation	Union Carbide
Union Carbide European Research Associates (Brussels)	Un Car E Res Assoc
Union Carbide Research Institute	Union Car Res Inst
Uniroyal, Incorporated	Uniroyal
United Aircraft Corporation	United Aircraft
United Aircraft Research Laboratories	United Aircraft/RL
United Kingdom Atomic Energy Authority (U.K.)	UK Atomic Energy A
United States Public Health Service	US Public Health S
United States Steel Corporation, Applied Research Laboratory	US Steel/App Res L
The United States Stoneware Company	US Stoneware
United Technology Corporation	United Technology
Universal Chemical Systems, Inc.	Universal Chem Sys
Universal Match Corporation	Universal Match
Universal Oil Products Co.	Universal Oil Prod
URS Corporation	URS
U.S. Atomic Energy Commission See: Atomic Energy Commission	
U.S. Brox Research Corporation	US Borax Research
U.S. Forest Service See: Forest Service, U.S. Dept. of Agriculture	
U.S. Industrial Chemicals Company	US Industrial Chem
University of Utah	U Utah
Value Engineering Company	Value Engineering
University of Vermont	U Vermont
Vidya, Division of Itek Corporation	Vidya/Itek
University of Vienna	U Vienna

University of Virginia	U Virginia
The Visking Corporation	Visking
Vitro Engineering Company	Vitro Engineering
Vitro Laboratories	Vitro Laboratories
Walter Kidde and Company	Walter Kidde
The Warner and Swasey Company	Warner + Swasey
University of Washington	U Washington
Watertown Arsenal	Watertown Arsenal
The Welsbach Corp	Welsbach
Western Gear Corporation	Western Gear
Western Reserve University	Western Reserve U
Westinghouse Astronuclear Laboratory	Westinghouse Ast L
Westinghouse Electric Corporation	Westinghouse Elec
Westinghouse Research Laboratories	Westinghouse Res L
White Sands Proving Ground	White Sands Prov G
Willow Run Research Center	Willow Run Res C
University of Wisconsin	U Wisconsin
Wright Air Development Center	Wright Air Devel C
Wright Air Development Division	Wright Air Devel D
Wyandotte Chemicals Corporation	Wyandotte Chemical
Wyle Laboratories	Wyle
Young Development Laboratories	Young Development

3. ABBREVIATIONS USED IN CORPORATE SOURCE DESIGNATIONS

Admiralty	=	ADM
Advanced	=	ADV
Aeronautic (s)	=	AERO
Aeronautical	=	AERON
Agency	=	AG
Air Force	=	AF
Aircraft	=	AC
American	=	AM
Associates	=	ASSOCS
Astronautic (s)	=	ASTRO
Center	=	C
Command	=	COMD
Contract	=	CONTR
Commercial	=	COM
Defence) Defense)	=	DEF
Engineering	=	ENG
Europe - ean	=	E
Foundation	=	FDN
Guided Missile Agency	=	GMA
Imperial	=	IMP
Industries	=	INDS
Institute	=	IN or INST
International	=	INT
Jet Propulsion Center	=	JPC
Laboratory	=	L or LAB
Management	=	MGT
Manufacturing	=	MFG
Material	=	MATL
Ministry	=	MIN
Motors	=	MTRS
Products	=	PROD
Propulsion	=	PROP

Research	=	RES
Research and Development	=	R+D
Research and Engineering	=	R+E
Rocket	=	ROCK
Science	=	SCI
Systems	=	SY or SYS
Test Center	=	TC
Test Station	=	TS
United Kingdom	=	UK
University	=	U
Various Pages	=	VP

Section III

THESAURUS

Approximately 6,500 unique terms were generated in the permuted-title indexing of some 8,280 documents. These terms, related to the general field of propulsion, have been extensively cross-referenced to produce this thesaurus.

The full range of terminology, associated with propellants and propulsion, was not encountered in the documents indexed. The thesaurus is therefore, merely the basis for further work. Howerver, it does afford vocabulary control over a large portion of terms in the propulsion field. It also provides the framework of terms and cross-references for the addition of new terms.

To meet format requirements of the computer produced book catalog, terms have been standardized on a maximum length of 18 characters. Descriptors of greater length are presented in full, with a "See" reference to the 18 character reduction. A "Refer From" reference is provided from the 18 character reduction back to the complete descriptor.

Straight word order has been employed throughout the thesaurus. Thus some specific terms do not follow the associated broader term. In reverse word order, PROPULSION-HYBRID and PROPULSION-ION would follow the broader term PROPULSION. In this thesaurus HYBRID-PROPULSION and ION-PROPULSION are alphabetically separated from each other and the related broader term. However, "See Also" references draw these terms together.

Cross-references are indicated by SA, RF, and S.

SA (See Also) leads from a broad term to related narrower and more specific terms.

RF (Refer From) leads back from either a "See Also" or "See" reference.

S (See) directs the user from a synonym or variant form of a term to the term that is used.

These cross-references are intended to lead the user from any term he selects to any other terms which may be of interest.

ABC-Cordite
S: Cordite

ABL-X-254-A1
S: Rocket-Motr-ABL

ABL-X-254-Z2
S: Rocket-Motor-ABL

ABLATION

ABLATION-CHARS
RF: Ablative-Plastic-Chars
Chars
Plastic-Chars

ABLATION-MATERIALS
SA: Coatings
Composites
Heat-Shield-Matls
Nozzle-Materials
Phenolic-Polymers
Plastics
Refractories
Reinvorced-Plastic
RF: Ablative-Materials
Ablators
Combustion-Chamber
Thrust-Chamber

Ablative-Materials
S: Ablation-Materials

Ablative-Plastic-Chars
S: Ablation-Chars
Chars

Ablators
S: Ablation-Materials

ABLE-1-MISSILE
RF: Missle

ABLE-1-PROJECT
RF: Space-Probes

ABNORMAL-BURNING
RF: Burning

ABORT
SA: Landing-Impact
Recovery
Safety

ABRASION
SA: Erosion
Organic-Coatings
RF: Erosion

Absorbance
S; Absorptance

ABSORBENT
SA: Shield-Materials

ABOSRBER
SA: Acoustic-Liners
Scatterers
Shield-Materials
Shock-Absorber

ABSORPTANCE
SA: Optical-Absorbance
Reflectance
Transmittance
RF: Absorbance

ABSORPTION
RF: Sorption

ABSORPTION-CELLS

ABSTRACTS
SA: Bibliography
Indexes
RF: Bibliography
Indexes

ACCELERATED-AGING
RF: Aging

ACCELERATED-TESTS
RF: Tests

ACCELERATION
SA: High-Acceleration
Linear-Acceleret

A-Glucose
  S: Alpha-d-glucose

ABC-Cordite
  S: Cordite

ABL-X-254-A1
  S: Rocket-Motor-ABL

ABL-X-254-A2
  S: Rocket-Motor-ABL

ABLATION

ABLATION-CHARS
  RF: Ablative-Plastic-Chars
    Chars
    Plastic-Chars

ABLATION-MATERIALS
  SA: Coatings
    Composites
    Heat-Shield-Matls
    Nozzle-Materials
    Phenolic-Polymers
    Plastics
    Refractories
    Reinforced-Plastic
  RF: Ablative-Materials
    Ablators
    Combustion-Chamber
    Thrust-Chamber

Ablative-Materials
  S: Ablation-Materials

Ablative-Plastic-Chars
  S: Ablation-Chars
    Chars

Ablators
  S: Ablation-Materials

ABLE-1-MISSLE
  RF: Missle

ABLE-1-PROJECT
  RF: Space-Probes

ABNORMAL-BURNING
  RF: Burning

ABORT
  SA: Landing-Impact
    Recovery
    Safety

Absorbance
  S: Absorptance

ABSORBENT
  SA: Shield-Materials

ABSORBER
  SA: Acoustic-Liners
    Scatterers
    Shield
    Shield-Materials
    Shock-Absorber

ABSORPTANCE
  SA: Optical-Absorbance
    Reflectance
    Transmittance
  RF: Absorbance

ABSORPTION
  RF: Sorption

ABSORPTION-CELLS

ABSTRACTS
  SA: Bibliography
    Indexes
  RF: Bibliography
    Indexes

ACCELERATED-AGING
  RF: Aging

ACCELERATED-TESTS
  RF: Tests

ACCELERATION
  SA: High-Acceleration
    Linear-Accelerat

ACCELERATION-FIELD

ACCELERATION-FLOWS

ACCELERATION-LOADS
SA: Load-Relief-System
RF: Loads

ACCELERATION-RANGE

ACCELERATION-TESTS
RF: Tests

ACCELEROMETER
SA: Gyroscopes
Inertial-Navigation
RF: Flight-Instruments
Indicators
Instruments

ACCIDENT-HAZARDS
SA: Safety-Precautions
WS-Hazards
RF: Hazards
Safety-Precautions

ACCIDENT-INVEST
SA: Airplane-X-2
RF: Accident-Investigation

Accident-Investigation
S: Accident-Invest

Accidental-Explosions
S: Explosion

ACCIDENTAL-FIRING
RF: Accidents
Launching-Hazards
Missile-Safety
WS-Hazards

ACCIDENTS
SA: Accidental-Firing
Crash-Fires
Damage-Control
Explosion
Fires
Safety

ACCOMMODATION-COEF
RF: Accommodation Coefficients
Coefficients

Accommodation-Coefficients
S: Accommodation-Coef

Accumulator
S: Calculator
Data-Accumulator

ACCURACY
SA: Microsecond
Millimicrosecond
Monte-Carlo-Method
Rocket-Accuracy
Time-Intervals

ABRASION
SA: Erosion
Organic-Coatings
RF: Erosion

ACE-ENGINE
RF: Engine

ACETALAZINE
SA: Azine
Hydrazine
Hydrazone

ACETALDAZINE

ACETAMIDE
RF: Amides
Fluoro-Nitro-Comp

ACETIC-ACID

ACETIC-ANHYDRIDE
RF: Acetic-Oxide
Acetyl-Oxide
Ethanoic-Anhydride

Acetic-Oxide
S: Acetic-Anhydride

ACETONE
RF: Dimethyl-Ketone
Ketone-Propane
Ketones
Propoanone

ACETONE-CYANHYDRIN
RF: Acetone-Cyanchydrin
Oxyisobutyric-Nitrile

Acetone-Cyanchydrin
S: Acetone-Cyanhydrin

ACETONITRILE
RF: Ethane-Nitrile
Methyl-Cyanide
Oxidizer-Binders

ACETYL-CHLORIDE
RF: Ethancyl-Chloride

Acetyl-Oxide
S: Acetic-Anhydride

ACETYLACETONATE-CR
RF: Acethlacetonate-of-Chromium
Chromium-Acetyl-Ocetonate

Acetylacetonate-of-Chromium
S: Acetylacetonate-Cr

ACETYLACETONE
RF: Ketones

ACETYLATION-METHOD

ACETYLENE
SA: Carbon-Formation
Diacetylene
Flame-Propagation
Flame-Speed
Metalc-Acetylenes
Methylacetylene
Schoch-Process
Specific-Impulse
RF: Ethyne

ACETYLENE-ADDITIVE

ACETYLENE-ANALYSIS
RF: gas-analysis

ACETYLENE-COMPOUND
RF: Acetylenic-Compounds
Compounds

ACETYLENE-DERIV
RF: Acetylenic-Derivative

ACETYLENE-DIBORANE

ACETYLENE-HAZARD
RF: gaseous-Hazard

ACETYLENE-MATERIAL
RF: Acetylenic-Materials
Materials

ACETYLENE-PROCESS

ACETYLENE-PROPEL
RF: Acetylene-Propellants
Acetylenic-Liquid-Propellants
Acetylenic-Monopropellants
Acetylenic-Propellants
Propellants

Acetylene-Propellants
S: Acetylene-Propel

ACETYLENE-REACTION

ACETYLENE-RESEARCH
RF: Research

ACETYLENE-TESTS
RF: Tests

Acetylenic-Compounds
S: Acetylene-Compounds

Acetylenic-Derivative
S: Acetylene-Deriv

Acetylenic-Liquid-Propellants
S: Acetylene-Propell

Acetylenic-Materials
S: Acetylene-Material

Acetylenic-Monopropellants
S: Acetylene-Propell

Acetylenic-Propellants
S: Acetylene-Propell

ACETYLIDES
SA: Sodium-Acetylide
RF: Metal-Carbides
Metallic-Carbides

ACID-CONTAMINATION
RF: Contamination

ACID-HANDLING

ACID-HAZARDS
SA: Nitric-Acid-Hazard
RF: Liquid-Hazards

ACID-PREPARATION

ACID-PROPERITES

ACID-REACTION

Acid-Resistant-Coatings
S: Protective-Coating

ACID-STORAGE
RF: Storage

ACID-TANKS
RF: Tanks

ACID-VOLATILITY
RF: Volatile-Liquids

ACIDS
SA: Acrylic-Acid
Boric-Acid
Butyric-Acid
Chromic-Acid
Hydrazoic-Acid
Hydrofluoric-Acid
IRFNA
IWFNA
Lewis-Acid
Meta-Boric-Acid
Mixed-Acid
Nitric-Acid
Ortho-Boric-Acid
Perchloric-Acid
RFNA
Stearic-Acid
Sulfuric-Acid
WFNA

ACOUSTIC-LINERS
RF: Absorber
Liners

ACOUSTIC-LOSSES
RF: Losses

ACOUSTICS
RF: Sound

ACRYLAMIDE
SA: Polyacrylamide
RF: Amides

Acrylate
S: Acrylic-Resin

Acrylate-Resin
S: Acrylic-Resin

ACRYLIC-ACID
RF: Acids
Acroleic-Acid
Propene-Acid

ACRYLIC-RESIN
RF: Acrylate
Acrylate-Resin
Binders
Resin-Binders

ACTIVATED-CARBON
RF: Activated-Charcoal
Charcoal-Activated

Activated-Charcoal
S: Activated-Carbon

ACTIVATION-ENERGY
RF: Energy

ACTIVE-DEFENSE
SA: Antimissiles
Countermeasures
Evasive-Satellite
Space-Patrols
Surveillance
RF: Defense
Missile Defense

ACTIVE-METALS
SA: Alkoli-Metals
RF: Alloys
Metal-Additives
Metals

ACTUATION-SYSTEMS
SA: Actuators

ACTUATORS
SA: Explosive-Actuator
RF: Actuation-Systems
Propellant-Actuated-Devices

Adaptive-Control-Systems
S: Adaptive-Controls

ADAPTIVE-CONTROLS
RF: Adaptive-Control-Systems
Controls

ADDITIVE-EFFECTS
RF: Buring-Rate
Propellant-Burning

ADDITIVE-PROGRAM

ADDITIVES
SA: Al-Additives
Catapysts
Chemical-Additives
Fuel-Additives
Metal-Additives
Propellant-Add
Silicon-Additives
RF: Catalysts
Propellant-Add

ADDITIVES-RESEARCH
RF: Research

ADDUCTS
RF: Chemical-Reaction
Molecular-Reaction
Reaction

ADHESIVES
SA: Bonding
Case-Bonding
Metal-Bonds
Polymer-Adhesives
Sealants

Adiabatic-Compression
S: Adiabatic-Compress

ADIABATIC-EXPANS
RF: Adiabatic-Expansion
Expansion

Adiabatic-Expansion
S: Adiabatic-Expans

ADIABATIC-FLOW
RF: Flow
gas-Flow

ADMITTANCE
SA: Impedance
RF: Impedance

ADMITTANCE-THEORY

Admixture
S: Compound
Mixture

ADSORPTION
SA: Borane-Adsorption
gas-Adsorption
RF: Sorption

ADVANCED-BASES
RF: Bases
Logistics

AERATION
RF: Liquids

AERODYNAMIC-CONFIG
RF: Aerodynamic-Configuration
Configuration

Aerodynamic-Confimurations
S: Aerodynamic-Config

AERODYNAMIC-DESIGN
RF: Design

AERODYNAMIC-FORCES
RF: Forces

AERODYNAMIC-FORMU
RF: Aerodynamic-Formulas

Aerodynamic-Formulas
S: Aerodynamic-Formu

AERODYNAMIC-HEAT
RF: Aerodynamic-Heating
Heating

Aerodynamic-Heating
S: Aerodynamic-Heat

AERODYNAMIC-NOMEN
RF: Aerodynamic-Nomenclature

Aerodynamic-Nomenclature
S: Aerodynamic-Nomen

AERODYNAMIC-RES
RF: Aerodynamic-Research
Research

Aerodynamic-Research
S: Aerodynamic-Res

AERODYNAMICS
SA: Combustion-Aero-dy
Drag
Friction
Slipstream

AEROELASTIC-ANAL
RF: Aeroelastic-Analysis
Analysis

Aeroelastic-Analysis
S: Aeroelastic-Anal

AEROGENS
RF: gas-generation

AEROSOL-GENERATORS
RF: generators

AEROSOLS
RF: Atomization
Atomizers
Sprays

Aerospace-Environment
S: Space-Environment

AEROSPACE-GD-EQUIP
RF: Aerospace-ground-Equipment
ground-Support

Aerospace-ground-Equipment
S: Aerospace-gd-Equip

AEROSPACE-METALS
SA: Aluminum
Light-Metals
RF: Alloys
Metals

Aerospace-Plane
S: Aerospace-Vehicles

AEROSPACE-PROPULS
RF: Aerospace-Propulsion
Propulsion

Aerospace-Propulsion
S: Aerospace-Propuls

AEROSPACE-RESEARCH
RF: Research
Space-Sciences

AEROSPACE-STRUCTUR
RF: Aerospace-Structures
Structures

Aerospace-Structures
S: Aerospace-Structur

AEROSPACE-VEHICLES
    SA: Aspen
        Launch-Vehicles
        Manned-Vehicles
        Orbital-Carrier
        Orbital-Vehicles
        Reentry-Vehicles
        Spacecraft
    RF: Aerospace-Plane
        Aerospaceplane
        Aircraft
        Vehicles

Aerospaceplane
    S: Aerospace-Vehicles

AEROSPIKE-ENGINE
    RF: Engine

AEROTHERMODYNAMICS
    SA: Thermodynamics
    RF: Thermodynamics

AEROZINE

AFTERBURNER
    RF: Engine
        Thrust-Augment

AFTERBURNING

AFTERCOOLING
    RF: Cooling

AFTERGLOW

AFTERGLOW-COOLING
    RF: Cooling

AFTERHEATER

AGED-PROPELLANTS
    RF: Propellants

AGING
    SA: Accelerated-Aging
        Degradation
        Safe-Life
        Strain-Aging
    RF: Missile-Storage

AGING-CHARACTERIST
    RF: Aging-Characteristics

Aging-Characteristics
    S: Aging-Characterist

AGING-EFFECTS

AGING-PROPERTIES

AGING-STUDY
    RF: Studies

AICBM
    RF: Antimissiles

AIM-X
    RF: Airplane-F-104
        Big-Q
        Missile

AIR
    SA: Compressed-Air
        Compressible-Flow
        Quiescent-Air
        Thermal-Conduct

AIR-AUGMENTED
    RF: Rocket-Engine

AIR-BREATHING
    RF: Engine

AIR-DISPERSION
    RF: Meteorology

AIR-FORCE

AIR-FUEL-COMBUST
    RF: Air-Fuel-Combustion
        Combustion

Air-Fuel-Combustion
    S: Air-Fuel-Combust

AIR-LAUNCHED
    SA: Skybolt
    RF: Air-Launched-Missile
        Missile

Air-Launched-Missiles
S: Air-Launched

AIR-MIXTURES
RF: Mixture

AIR-PERMEABILITY
RF: Permeability

AIR-POLLUTION

AIR-STREAM
SA: Slipstream

AIR-TEMPERATURE
RF: Temperature

AIR-TO-AIR
SA: Sparrow
Typhon
RF: Missile
Rocket

AIR-TO-SURFACE
SA: Rascal
Shrike
RF: Missile
Rocket

AIR-TURBOROCKET
RF: Turborocket

AIR-TURBULENCE
RF: Atmosphere
Turbulent-Air

AIRBORNE

AIRBORNE-ALERT
RF: Weapon-System

AIRCRAFT
SA: Aerospace-Vehicles
Helicopters
Hypersonic-Vehicle
SST
Transonic-Aircraft
RF: Airplanes
Conventional-Aircraft

Aircraft & Model Number
S: Airplane -

Aircraft-Crash-Fires
S: Crash-Fires

AIRCRAFT-ENGINES
SA: JATO
Power-Plants
Rocket-Propelled
RF: Engine

AIRCRAFT-FUEL-TANK
RF: Fuel-Tanks

AIRCRAFT-FUELS
SA: gasoline
RF: Aviation-gasoline
Fuels
Propellants
Solid-Propellants

AIRCRAFT-INDUSTRY

AIRCRAFT-LUBRICANTS
RF: Lubricants

AIRCRAFT-METALS
RF: Aircraft-Skins
Metals

AIRCRAFT-ROCKET
RF: Rocket

AIRCRAFT-SKINS
SA: Aircraft-Metals

AIRCRAFT-STRUCTURE
SA: Airframe
RF: Structures

AIRFRAME
SA: Missile-Airframe

RF: Aircraft-Structure

AIRPLANE-F-86

AIRPLANE-F-104
SA: AIM-X

AIRPLANE-X-2
RF: Accident-Invest

AIRPLANE-X-15

AIRPLANE-XB-47

Airplanes
S: Aircraft

AL-61ST6
RF: Aluminum-Alloy

AL-1100-0
RF: Aluminum-Alloy

AL-2024-T4
RF: Aluminum-Alloy

AL-2219-T87
RF: Aluminum-Alloy

AL-6061
RF: Aluminum-Alloy

AL-7075
RF: Aluminum-Alloy

AL-ADDITIVES
RF: Additives

AL-ALLOY-FATIGUE
RF: Aluminum-Alloy-Fatigue
Fatigue

AL-BORIDE
RF: Borides

AL-BOROHYDRIDE
RF: Borohydrides

AL-CARBIDE
RF: Carbides

AL-CASTING
RF: Casting

AL-CHLORIDE
RF: Chlorides

AL-COMBUSTION
SA: Al-Hazards
RF: Combustion

AL-CORROSION
SA: AL-RFNA-Corrosion
RF: Corrosion
FNA-Storage

AL-CREEP
RF: Creep

AL-CRYOGENIC-PROP
RF: Al-Properties

AL-CRYOGENIC-USES

AL-DETERMINATION

AL-DETONATION
SA: Al-Hazards
RF: Detonation

AL-FORMABILITY
RF: Formability

AL-HAZARDS
SA: Fire-Hazards
RF: Al-Combustion
Al-Detonation

AL-HYDRIDE
RF: Hydrides

AL-HYDRIDE-PREP
RF: Aluminum-Hydride-Preparation

AL-HYDRIDE-PROP
RF: Aluminum-Hydride-Properties

AL-IMPACT-STRENGTH
RF: Impact-Strength

AL-JOINING
SA: Al-Welding
RF: Joining

AL-NITRIDE

AL-POWDER
RF: Powder

AL-PROPERTIES
SA: Al-Cryogenic-Prop

AL-RECOVERY
RF: Recovery

AL-RFNA-CORROSION
RF: Al-Corrosion
Aluminum-Red-Fuming-Nitric
-Acid-Corrosion
FNA-Storage
RFNA-Corrosion

AL-SILICATE

AL-SLUDGE

AL-TANKS
RF: FNA-Storage
Tanks

AL-TENSILE-TESTS
RF: Tests

AL-TUBING
RF: Tube

AL-WELDING
RF: Al-Joining
Welding

AL-WELDING-INSPECT
RF: Welding-Inspection

ALABASTER
RF: gypsum

ALCOHOL
SA: Allye-Alcohol
Buty -Alcohol
Diacetone-Alcohol
Ether-Alcohol
Ethyl-Alcohol
Furfurye-Alcohol
Isopropye-Alcohol
Methyl-Alcohol
Propargye-Alcohol
Propyl-Alcohol

ALCOHOL-ACRYLATES
SA: Resin-Binders

ALCOHOL-FUEL-TESTS
RF: Fuel-Tests

ALCOHOL-MOTOR
RF: Motors

ALDEHYDES
SA: Formaldehyde
Furfural
glyoxal
RF: Ketones

Aliphatic-Hydrocarbons
S: Alkanes

ALKALI-METALS
SA: Cesium
Lithium
Potassium
Rubidium
Sodium
Virginium
RF: Active-Metals

ALKANES
RF: Aliphatic-Hydrocarbons
Hydrocarbons

ALKOXIDES

ALKYLATION
SA: Boron-Alkylation

ALKYLCHLOROBORANE
RF: Dialkylchloroborane

ALKYLBORANE

ALKYLBORATE
RF: Borates

ALKYLBOROXINE

ALKYLDIAMINE

ALKYLDIBORANE

ALKYLDIHALIDE

ALKYLHYDRAZINE

ALKYLTHIOPHOSPHITE

Allene
S: Propadiene

ALLOY-MACHINING
SA: Titanium-Machining
RF: Machining

ALLOY-PROPERTIES

ALLOY-WELDABILITY
RF: Weldability

ALLOYING-PROCESS
SA: Sintering

ALLOYS
SA: Active-Metals
Aerospace-Metals
Aluminum-Alloy
Be-Al-Alloys
Chromium-Alloy
Columbium-Alloy
Copper-Alloy
Corrosion
Ductile-Alloys
Ferrous-Alloys
Hafnium-Alloys
Highstrength-Alloys
Invar
Iridium-Alloys
Iran-Nickel-Alloy
Law-Alloy-Steel
Molybdenum-Alloy
Nickel-Base-Alloy
Nonferrous-Alloys
Refractory-Alloys
Sheet-Alloys
Stainless-Steel
Steels

ALLYL-ALCOHOL
RF: Alcohol

ALLYAMINE
RF: Amines

ALLYL-CHLORIDE
RF: Chlorides

ALPHA-D-GLUCOSE
SA: Beta-d-glucose
glucose
Pentaacetate
RF: A-glucose
Beta-d-glucose
glucose

ALPHA-TITANIUM
RF: Titanium-Alloy

ALTITUDE
SA: High-Altitude
Low-Altitude

ALTITUDE-CELLS
RF: Test-Cells

ALTITUDE-COMPENS
RF: Altitude-Compensation

Altitude-Compensation
S: Altitude-Compens

ALTITUDE-CONTROL
RF: Flight-Control

ALTITUDE-EVAL
RF: Altitude-Evaluation

Altitude-Evaluation
S: Altitude-Eval

ALTITUDE-FACILITY
SA: Altitude-Test-Cell
Altitude-Test-Cham
Altitude-Tests
RF: Research-Facility
Test-Facility

ALTITUDE-EFFECT

ALTITUDE-INVESTIGA
RF: Altitude-Investigation

Altitude-Investigation
S: Altitude-Investiga

ALTITUDE-PERFORM
RF: Altitude-Performance

Altitude-Performance
S: Altitude-Perform

ALTITUDE-SIMULAT
RF: Altitude-Simulation
Simulation

Altitude-Simulation
S: Altitude-Simulat

ALTITUDE-TEST-CELL
RF: Altitude-Facility
Test-Equipment

ALTITUDE-TEST-CHAM
RF: Altitude-Test-Chamber
Altitude-Facility
Chambers
Test-Equipment

Altitude-Test-Chamber
S: Altitude-Test-Cham

ALTITUDE-TESTS
RF: Altitude-Facility
Tests

ALUMINA
RF: Aluminum-Oxide
Refractories

ALUMINA-WHISKERS
RF: Whiskers

ALUMINUM
SA: Headings under Al.
Metallic-Aluminum
Trimethyl-Al-Hydra
Triethylaluminum
RF: Aerospace-Metals
Light-Metals

ALUMINUM-ALLOY
SA: Al-61ST6
Al-1100-0
Al-2024-T4
Al-2219-T87
Al-6061
Al-7075
RF: Alloys

Aluminum-Alloy-Fatigue
S: Al-Alloy-Fatigue

Aluminum-Hydride-Preparation
S: Al-Hydride-Prep

Aluminum-Hydride-Properties
S: Al-Hydride-Prop

Aluminum-Oxide
S: Alumina

Aluminum-Red-Fuming-Nitric-Acid-Corrosion
S: AL-RFNA-Corrosion

ALUMIZINE

ALUMIZINE-PROPEL
RF: Alumizine-Propellants
Propellants

Alumizine-Propellants
S: Alumizine-Propel

AMBIENT-PRESSURE
RF: Pressure

AMBIENT-TEMP
RF: Ambient-Temperature
Temperature

Ambient-Temperature
S: Ambient-Temp

AMIDES
SA: Acetamide
Acrylamide
Formamide
guanidines
Nylon
Sodium-Amide

AMINE-NITRATES

AMINE-ROCKET-FUELS
RF: Rocket-Fuels

AMINE-SALTS
RF: Salts

AMINES
SA: Allyamine
Aniline
Ben-ylamine
Butylamine
Diamine
Dibutylamine
Diethanolamine
Diethylamine
Dimethylamine
Diphenylamine
Ethanolamine
Ethylamine
Fluoramine
Methylamine
Orthotoluidine
Polyamines
Propargyl-Amine
Propylamine

Aminobenzene
S: Aniline

AMMONIA
SA: Anhydrous-Ammonia
Liquid-Ammonia
RFNA-Ammonia

AMMONIA-COMBUSTION
RF: Combustion

AMMONIA-COMPOUNDS
RF: Compounds

AMMONIA-DECOMPOSIT
RF: Ammonia-Decomposition
Decomposition

Ammonia-Decomposition
S: Ammonia-Decomposit

AMMONIA-FUELS
RF: Rocket-Fuels

AMMONIA-HAZARD
RF: gaseous-Hazard

AMMONIA-IGNITION
RF: Ignition

AMMONIA-PHOTOLYSIS
RF: Photolysis

AMMONIA-TOXICITY
RF: Toxicity

AMMONIUM-AZIDE
RF: Azides

AMMONIUM-BOROHYD
RF: Ammonium-Borohydride
Borohydrides

Ammonium-Borohydride
S: Ammonium-Bo.ohyd

AMMONIUM-NITRATE
RF: Burning-Rate
Nitrate
Propellants
Solid-Oxidizers

AMMONIUM-PENTABORA
RF: Ammonium-Pentaborate

Ammonium-Pentoborate
S: Ammonium-Pen.abora

AMMONIUM-PERCHLOR
RF: Ammonium-Perchlorate
JPL-X500
Perchlorates
Solid-Oxidizers

Ammonium-Perchlorate
S: Ammonium-Perchlor

AMMUNITION
SA: Case-Materials
Ignition-Systems
Tracers
RF: Ballistics

AMMUNITION-ANAL
RF: Ammunition-Analysis
Analysis

Ammunition-Analysis
S: Ammunition-Anal

AMPLIFIERS
SA: Feedback
Fluid-Amplifiers
Parametric-Amp

AN-F-58-FUEL
RF: Fuels

ANALOG-COMPUTERS
RF: Computers

Analyses
S: Analysis

ANALYSIS
SA: Aeroelastic-Anal
Ammunition-Anal
Chemical-Analysis
Combustion-Anal
Cost-Analysis
Failure-Analysis
Flight-Analysis
Flow-Analysis
Gas-Analysis
Heat-Transfer-Anal
Igniter-Analysis
Infrared-Analysis
Instability-Anal
Mission-Analysis
Performance-Anal
Physical-Analysis
Propellant-Anal
Quantitiative-Anal
Radiation-Analysis
Safety-Analysis
Spectral-Analysis
Spectrometric-Anal
Stability-Analysis
Stress-Analysis
Structural-Anal
Systems-Analysis
Tensor-Analysis
Theoretical-Anal
Thermal-Analysis
Thermodynamic-Anal
Ultraviolet-Anal
Vehicle-Analysis
Weight-Analysis

ANALYSIS-TECHNIQUE
SA: Differential-Anal
gas-Chromatography

ANALYTICAL-CHEM
RF: Alaiytical-Chemistry
Chemistry

Analytical-Chemistry
S: Analytical-Chem

ANALYTICAL-MODELS
RF: Models

ANALYZERS
SA: Spectrum-Analyzer
RF: Instruments

ANHYDROUS-AMMONIA
RF: Ammonia

Anhydrous-Nitric-Acid
S: IRFNA
IWFNA
Nitric-Acid
RFNA
WFNA

ANILINE
RF: Amines
Aminbenzene
Phenylamine

ANIMAL-STUDIES
RF: Studies

ANNEALING
RF: Ductility
Metalworking

ANNULAR-NOZZLES
RF: Nozzles

ANODIZED-COATINGS
RF: Coatings

ANTENNAS
RF: Radio-Propagation

ANTI-COKING
SA: Carbon
RF: Fuel-Additives

ANTIDOTES
RF: Health-Hazards
Safety-Precautions
Toxicity

ANTIMISSILES
SA: AICBM
Wizard
RF: Active-Defense
Missile-Defense

ANTIMONY-SULFIDE
RF: Sulfides

Antisubmarine-Missile
S: ASW-Missile

APOLLO
SA: Command-Module
LEM
Saturn
RF: Spacecraft

APOLLO-PROPULSION
RF: Propulsion

APPLIED-RESEARCH
RF: Research

ARC-IGNITION
RF: Ignition

ARC-IMAGE-FURNACE
RF: Arc-Imaging-Furnace
Furnaces
Ignition-Tests

Arc-Imaging-Furnace
S: Arc-Image-Furnace

ARC-PROCESS

ARC-WELDING
RF: Welding

ARCITE-368
RF: Solid-Propellants

ARCOCEL-332E
RF: Solid-Propellants

ARCOCEL-364
RF: Solid-Propellants

ARCON
RF: Sounding-Rockets

ARDC-Model-Atmosphere
S: Standard-Atmos

ARGON
RF: gases

ARGUS-EFFECT
RF: Nuclear-Radiation
Van-Allen-Belt

ARMAMENT
RF: Weapon-System

ARMS-CONTROL
RF: Weapon-System

AROMATIC-COMPOUNDS
SA: Aromatic-Hydrocarb
RF: Compounds

AROMATIC-HYDROCARB
RF: Aromatic-Compounds
Aromatic-Hydrocarbons
Hydrocarbons

Aromatic-Hydracarbons
S: Aromatic-Hydrocarb

ARROW-TYPE-MOTOR
RF: Motors

ARTIFICIAL-ENVIRON
RF: Artificial-Environment
Environment
Simulation

Artificial-Environment
S: Artificial-Environ

ARTILLERY
RF: Weapons

ARTILLERY-PRIMERS
SA: Black-Powder
RF: Igniters

ARTILLERY-ROCKETS
SA: Little-John
RF: Rocket

AS-WELDED-JOINTS
RF: Joints

ASBESTOS
RF: Insulation

ASPEN
RF: Aerospace-Vehicles
Nuclear-Engines

ASPHALT
SA: GALCIT-65
RF: Solid-Propellants

ASROC
RF: ASW-Missile

ASSET-VEHICLE
RF: Reentry-Vehicles

ASW-MISSILE
SA: ASROC
RF: Antisubmarine-Missile
Missile

ATLAS
SA: WS-107A
RF: Ballistic-Missile

ATMOSPHERE
SA: Air-Turbulence
Atmospheric-Press
CAT
Clouds
HI-CAT
Humidity
Ionosphere
Meteorology
Quiescent-Air
Standard-Atmos
Upper-Atmosphere
RF: Meteorology
Turbulence

ATMOSPHERIC-PRESS
RF: Atmosphere
Atmospheric-Pressure
Pressure
Superatmospheric-Pressure

Atmospheric-Pressure
S: Atmospheric-Press

ATMOSPHERIC-PROP
RF: Atmospheric-Properties

Atmospheric-Properties
S: Atmospheric-Prop

ATOM
SA: Molecule
RF: Molecule

ATOMIC-HYDROGEN
RF: Hydrogen

ATOMIC-WEAPONS
RF: Weapons

ATOMIZATION
SA: Aerosols
Droplets
RF: Spray-Formation

ATOMIZED-FUEL
RF: Fuels
Sprays

ATOMIZERS
SA: Aerosols

ATTITUDE-CONTROL
SA: Mass-Expulsion
RF: Control-Systems
Flight-Control
Satellite-Control

AUTODECOMPOSITION
RF: Decomposition

AUTOPILOT
RF: Flight-Control

AUXILIARY-POWER
SA: Power-Supplies
SNAP
RF: generators
Power-Plants

AUXILIARY-TANKS
RF: Tanks

Aviation-gasoline
S: Aircraft-Fuels

AXIAL-FLOW
RF: Flow

AXIAL-FORCES
RF: Forces

AXIAL-LOADS
RF: Loads

AZIDES
SA: Ammonium-Azide
Sodium-Azide
RF: Hydrazoic-Acid

AZINE
SA: Triazine
RF: Acetalazine

AZODIFORMAMIDINE

B-H-C-N-COMPOUNDS
RF: Compounds

B-N-PROPELLANTS
RF: Propellants

B-N-H-PROPELLANTS
RF: Solid-Propellants

BALL-PROPELLANTS
RF: Propellants

Ballistic-Centrifuge
S: Centrifuge

BALLISTIC-DATA

BALLISTIC-MISSILE
SA: Atlas
Basing-Concept
Boosters
ICBM-Systems
Intercept-X
Rover
RF: Missile

Ballistic-Missile-Defense
S: Missile-Defense

BALLISTIC-MODIFIER

BALLISTIC-PERFORM
RF: Ballistic-Performance
Performance

Ballistic-Performance
S: Ballistic-Perform

BALLISTIC-PROP
RF: Ballistic-Properties

Ballistic-Properties
S: Ballistic-Prop

BALLISTIC-STUDIES
RF: Studies

BALLISTIC-SYSTEM

BALLISTIC-TEST
RF: Tests

BALLISTICS
SA: Ammunition
External-Ballistic
gun-Firings
Interior-Ballistic
Terminal-Ballistic
RF: Weapons

BAR-MAGNETS
RF: Magnets

BARIUM

BARIUM-HYDROXIDE
RF: Hydroxides

BARIUM-NITRATE
RF: Nitrate

BARIUM-PERCHLORATE
RF: Perchlorates

BARIUM-PEROXIDE

BARIUM-TITANATE

BARRIER-MATERIALS
RF: Heat-Shield-Matls

BASE-HEATING
RF: Heating

BASE-PRESSURE
RF: Pressure

BASES
SA: Advanced-Bases
Lunar-Bases
Satellite-Bases

BASING-CONCEPT
RF: Ballistic-Missile

Bayonet-Type-Igniter
S: Igniters

BE-AL-ALLOYS
RF: Alloys

BE-BOROHYDRIDE
RF: Borohydrides

BE-COMPOUNDS
RF: Compounds

BE-CORROSION
RF: Corrosion

BE-EROSION
RF: Erosion

BE-FORGING
RF: Forging

BE-FORMING
RF: Forming

BE-HAZARD
RF: Health-Hazards

BE-HYDRIDE
RF: Metal-Hydrides

BE-JOINING
RF: Joining

BE-MACHINING
RF: Machining

Be-Oxide
S: Beryllia

BE-PROPERTIES

BE-RESEARCH
RF: Research

BE-SHEETS
RF: Sheets

BE-STRUCTURES
RF: Structures

BE-TOXICITY
RF: Toxicity

BELL-MODEL-8048
RF: Propulsion-System-Bell-Model
-8048

BELL-MODEL-8181
RF: Propulsion-System-Bell-Model
-8181

BELLOWS

BENZENE

BENZYLAMINE
RF: Amines

BERYLLIA
RF: Be-Oxide
Refractories

BERYLLIUM
SA: Headings under BE
RF: glucinum
High-Temp-Materials
Light-Metals

BETA-D-GLUCOSE
SA: Alpha-d-glucose
glucose
Pentaacetate
RF: Alpha-d-glucose
glucose

BETA-TITANIUM
SA: TI-3AL-11CR-13V
RF: Titanium-Alloy

BI-METALLIC-COMP
RF: Bi-Metallic-Compounds
Compounds

Bi-Metallic-Compounds
S: Bi-Metallic-Comp.

BI-METALLIC-POWDER
RF: Metal-Powder
Powder

BI-METALLICS
RF: Metals

BI-PROPELLANTS
RF: Bipropellants
Propellants

BIAXIAL-STRESS
RF: Stress

BIBLIOGRAPHY
SA: Abstracts
Indexes
References
RF: Abstracts
Indexes
Publications

Big-Q
S: Aim-X

BINDERS
SA: Acrylic-Resin
Elastomeric-Binder
Fuel-Binders
Nitrocellulose
Nitrogen-Rich-Bind
Oxidizer-Binders
Resin-Binders

BIOASTRONAUTICS
SA: Human-Factors
Space-Biology
Weightlessness
RF: Space-Sciences

BIOLOGICAL-EFFECTS
RF: Health-Hazards

Bipropellants
S: Bi-Propellants

BLACK-POWDER
RF: Artillery-Primers
Powder
Explosives

BLADDER-CELL
SA: Bladders
RF: Cells
Kel-F-Bladder-Cell

BLADDERS
SA: Cryogenic-Bladders
Expulsion-Bladders
RF: Bladder-Cell
Fuel-Tanks

BLAST-CHARACTER
RF: Blast-Characteristics

Blast-Characteristics
S: Blast-Character

BLAST-HAZARD
RF: Explosion-Hazards

BLOOD-SERUM
RF: Safety-Precautions
Toxicity

BLOWDOWN-TUNNEL
RF: Wind-Tunnel

BLUFF-BODIES
RF: Bodies

BODIES
SA: Bluff-Bodies
Many-Body-Problem
Three-Body-Problem
Two-Body-Problem

BODIES-OF-REVOLUT
SA: Shells-of-Revolut
RF: Bodies-of-Revolution

Bodies-of-Revolution
S: Bodies-of-Revolut

BOILING-FLUORINE
RF: Fluorine

BOILING-HEAT-TRANS
RF: Boiling-Heat-Transfer
Heat-Transfer

Boiling-Heat-Transfer
S: Boiling-Heat-Trans

BOILING-HYDRAZINE
RF: Hydrazine

BOILING-OXYGEN
RF: Oxygen

BOILING-POINT

BOND-ENERGY
RF: Energy

BONDING
SA: Case-Bonding
Diffusion-Bonding
Hydrogen-Bonding
Metal-Bonds
RF: Adhesives
Joining

BOOST-PUMPS
RF: Pumps

BOOST-TANKS
RF: Cryogenic-Boost-Tanks
Fuel-Tanks

BOOSTER-COSTS
RF: Costs

BOOSTER-IGNITER
RF: Igniters

BOOSTER-PROPULSION
RF: Propulsion

BOOSTER-ROCKET
RF: Rocket

BOOSTER-SUSTAINER

BOOSTER-SYSTEM

BOOSTER-TANK
RF: Fuel-Tanks

Booster-Vehicles
S: Boosters

BOOSTERS
SA: Missile-Boosters
Modular-Boosters
Payload
Recoverable-Boost
Saturn
Scout
Terrier-Booster
Thor-Agena
Torpedo-Booster
RF: Ballistic-Missile
Booster-Vehicles

BORANE
SA: Decaborane
Diborane
gaseous-Borane
Nonvolatile-Borane
Organoboranes
Solid-Borane
Tetraborane

RF: Boron-Hydride
Diborane

BORANE-ADSORPTION
RF: Adsorption

BORANE-ANALYSIS
RF: Chemical-Analysis

BORANE-COMBUSTION
RF: Combustion

BORANE-CONTAMINANT
RF: Contaminants

BORANE-CONVERSION
RF: Conversion

BORANE-DERIVATIVES

BORANE-DETECTOR
RF: Detector

BORANE-POLYMER
RF: Polymers

BORANE-PREPARATION

BORANE-REACTIONS
RF: Chemical-Reaction

BORANE-SPECTRA
RF: Spectra

BORANE-STUDIES
RF: Studies

BORANE-TOXICITY
RF: Toxicity

BORATES
SA: Alkylborate
Ca-Borate
Metaborate
Methyl-Borate
Sodium-Borate
Trimethyl-Borate

BORAX

BORIC-ACID
SA: Acid subheadings
Meta-Boric-Acid
Ortho-Boric-Acid
RF: Acids

BORIC-OXIDE

BORIDE-COMPOUNDS
RF: Compounds

BORIDES
SA: Al-Boride
Ca-Boride
Chromium-Boride
Columbium-Boride
Molybdenum-Boride
Silicon-Boride
Tantalum-Boride
Tetraboride
Titanium-Boride
Tungsten-Boride
Zirconium-Boride
RF: Metal-Borides

Boroethane
S: Diborane

BOROHYDRIDE-PREP
RF: Borohydride-Preparation

Borohydride-Preparation
S: Borohydride Prep

BORDHYDRIDE-RES
RF: Borohydride-Preparation
Research

Borohydride-Research
S: Borohydride Res

BOROHYDRIDES
SA: Al-Borohydride
Ammonium-Borohyd
Be-Borohydride
Ca-Borohydride
Li-Borohydride
Mg-Borohydride
Sodium-Borohydride
RF: Reducing-Agents

BORON
RF: Light-Metals

BORON-ALKYLATION
RF: Alkylation

BORON-ANALYSIS
RF: Chemical-Analysis

BORON-CARBIDE
RF: Carbides

BORON-CARBON-COMP
RF: Boron-Carbon-Compunds
Compounds

Boron-Carbon-Compounds
S: Boron-Carbon-Comp

BORON-COATINGS
RF: Coatings

VORON-COMBUSTION
RF: Combustion

BORON-COMPOSITION

BORON-COMPOUNDS
RF: Compounds

BORON-HALIDE
RF: Halides

Boron-Hydride
S: Borane

BORON-NITRIDE

BORON-OXIDE

BORON-TRICHLORIDE

BORON-TRIFLUORIDE

BOUNDARY-LAYER
RF: Turbulence

BOUNDARY-LAYER-CON
RF: Boundary-Layer-Control
Control-Systems

Boundary-Layer-Control
S: Boundary-Layer-Con

BRASS
RF: Copper-Alloy

BRAZING
RF: Joining

Bridgewire
S: Metal-Wire

BROMIDES
SA: Hydrogen-Bromide
Potassium-Bromide

BROMINE

BROMOETHYL-ETHERS
RF: Ether

BRONZE
RF: Copper-Alloy

BUBBLE-DYNAMICS

BUBBLE-FORMATION
RF: Formation

BULK-DENSITY
RF: Density

BULLPUP
RF: Missile
WS-321A

BUMBLEBEE-PROJECT
SA: Talos

BURN-LEACH-PROCESS
SA: Rover-Fuel
Uranium-Recovery

BURNER
SA: Plug-Burner-Tech

BURNER-STUDIES
RF: Studies

BURNER-TIP-TEMP
    RF: Burner-Tip-Temperature
        Temperature

Burner-Tip-Temperature
    S: Burner-Tip-Temp

BURNING
    SA: Abnormal-Burning
        Decomposition-Burn
        Diffusive-Burning
        Double-Burning
        Erosive-Burning
        Optimum-Burning
        Rapid-Burning
        Resonant-Burning
        Restricted-Burning
        Steady-State-Burn
        Uncontrolled-Burn
        Unstable-Burning
        Wormhole-Burning

BURNING-CHARACTER
    RF: Burning-Characteristics

Burning-Characteristics
    S: Burning-Character

BURNING-MECHANISMS

BURNING-PROCESS

BURNING-RATE
    SA: Additive-Effects
        Ammonium-Nitrate
        Consumption-Rate
        High-Burning-Rate
        Propellant-Burning
    RF: Consumption-Rate

BURNING-RATE-CON
    SA: Run-Away-Phenomena
    RF: Burning-Rate-Control
        Control-Systems

Burning-Rate-Control
    S: Burning-Rate-Con

BURNING-SPRAYS
    RF: Sprays

BURNING-TEMPS
    RF: Burning-Temperatures
        Temperature

Burning-Temperatures
    S: Burning-Temps

BURNING-VELOCITY
    RF: Velocity

BUTADIENE
    SA: Polybutadiene

BUTADIENE-DIOXIDE
    RF: Dioxides

BUTANE
    RF: Fluoro-Nitro-Comp

Butanol
    S: Butyl-Alcohol

BUTENE
    RF: Butylene

BUTYL-ALCOHOL
    RF: Alcohol
        Butanol
        N-Butanol
        N-Butyl-Alcohol

BUTYLAMINE
    RF: Amines

Butylene
    S: Butene

BUTYRIC-ACID
    RF: Acids
        Fluoro-Nitro-Comp

CADMIUM

CA-BORATE
    RF: Borates

CA-BORIDE
RF: Borides

CA-BOROHYDRIDE
RF: Borohydrides

CA-CARBIDE
RF: Carbides

CA-CHLORIDE
RF: Cholorides

CA-FLUORIDE
RF: Fluoride

CA-HYDRIDE
RF: Hydrides

CA-PEROXIDE

CA-RECOVERY
RF: Recovery

CA-RESINATE
RF: Resins

CALCIUM
SA: Headings under Ca.
RF: Light-Metals

CALCULATOR
SA: Computers
RF: Accumulator
Computers

CALORIMETER
RF: Instruments
Temperature-Meas

CALORIMETRY

CAMERAS
SA: High-Speed-Camera
Strobe-Control
RF: Photography

CANDELILIA-WAX
RF: Wax

CANNONBALL-PROJECT

CARBAMITE
RF: Plasticizers

CARBIDE-COATINGS
SA: Metal-Carbides
RF: Coatings

CARBIDE-COMPOSITES
RF: Composites

CARBIDE-CORE
RF: Nuclear-Engines
Reactor-Cores

CARBIDE-NOZZLES
RF: Nozzles

CARBIDES
SA: Al-Carbide
Boron-Carbide
Ca-Carbide
Chromium-Carbide
Iron-Carbide
Manganese-Carbide
Silicon-Carbide
Sodium-Carbide
Tantalum-Carbides
Titanuim-Carbide
Zirconium-Carbide
RF: Carbon

CARBON
SA: Carbides
Castable-Carbon
Fluorocarbons
Pyrolytic-Carbon
RF: Anti-Coking
Charcoal

CARBON-ARC-LAMPS
RF: Solar-Simulation

CARBON-BLACK
RF: gas-Combustion

CARBON-COATINGS
SA: Pyrolytic-Carbon
RF: Coatings

CARBON-COMBUSTION
RF: Combustion

CARBON-COMPOUNDS
RF: Compounds

CARBON-DETERM
RF; Carbon-Determination

Carbon-Determination
S: Carbon-Determ

CARBON-DIFLUORIDE

CARBON-DIOXIDE
RF: Dioxides

CARBON-DISULFIDE

CARBON-FIBERS
RF: Fibers
Whiskers

CARBON-FORMATION
SA: Chars
RF: Acetylene
Formation

CARBON-MONOXIDE

CARBON-PROPERTIES

CARBON-STEEL
RF: Steels

CARBON-SUBOXIDE

CARBON-TETRACHLOR
RF: Carbon-Tetrachloride

Carbon-Tetrachloride
S: Carbon-Tetrachlor

CARBONATES
SA: Sodium-Carbonate

CARBONYL-COMPOUNDS
RF: Compounds
Ketones

Cartridge-Case-Materials
S: Case-Materials

CASE-BONDED-PROPEL
RF: Case-Bonded-Propellants
Propellants

CASE-BONDING
RF: Adhesives
Bonding

CASE-MATERIALS
SA: Combustible-Cases
RF: Ammunition

Cases
S: Combustible-Cases
Motor-Cases

CASTABLE-CARBON
RF: Carbon

CASTING
SA: Al-Casting
Steel-Casting
RF: Forming
Metalworking

CASTING-POWDER
RF: Powder

CASTING-TECHNIQUES

CAT
RF: Atmosphere
Clear-Air-Turbulence
Turbulent-Air

CATALYSIS
RF: Chemical-Reaction

CATALYST-DEVELOP
RF: Catalyst-Development

Catalyst-Development
S: Catalyst-Develop

CATALYST-EFFECT

CATALYST-PERFORM
    RF: Catalyst-Performance

Catalyst-Performance
    S: Catalyst-Perform

CATALYSTS
    SA: Additives
        Iron-Catalyst
        Lewis-Acid
        Silver-Catalyst
    RF: Additives
        Reaction-Rate

CATALYTIC-CONVERS
    RF: Catalytic-Conversion
        Conversion

Catalytic-Conversion
    S: Catalytic-Convers

CATALYTIC-METHOD

CATALYTIC-PROCESS

CATAPULT-PROPEL
    RF: Catapult-Propellant
        Propellants

Catapult-Propellant
    S: Catapult-Propel

CATAPULT-XC-9

CATAPULTS

CAVITATION
    SA: Cavitating-Cond
        Noncavitating-Cond

CAVITATION-CHARACT
    RF: Cavitation-Characteristics

Cavitation-Characteristics
    S: Cavitation-Charact

CAVITATION-DETECT
    RF: Cavitation-Detection
        Detection

Cavitation-Detection
    S: Cavitation-Detect

CAVITATION-STUDIES
    RF: Studies

CAVITATING-COND
    RF: Cavitating-Conditions
        Cavitation

Cavitating-Conditions
    S: Cavitating-Cond

CELLS
    SA: Bladder-Cell
        Electrolytic-Cell
        Infrared-Cell
        Kerr-Cell
        Load-Cells
        Mercury-Cell
        Photocells
        Photovoltaic-Cells

CELLS-1000-AMP

CELLS-30000-AMP

CELLULOSE
    SA: Ethyl-Cellulose
        Nitrocellulose
    RF: Cellulosic-Materials

CELLULOSE-ACETATE
    SA: Ethyl-Cellulose
    RF: Coatings
        Inhibitor-Material
        Insulation

Cellulose-Nitrate
    S: Nitro-Cellulose

Cellulosic-Materials
    S: Cellulose

CENTRALITES
    SA: Ethyl-Centralite

CENTRIFUGAL-PUMPS
    RF: Pumps

CENTRIFUGE
RF: Ballistic-Centrifuge

CENTRIFUGING
SA: Filtration

CERAMIC-COATINGS
RF: Coatings

CERAMIC-EROSION
RF: Erosion

CERAMIC-LINERS
RF: Liners

Ceramic-Materials
S: Ceramics

CERAMICS
RF: Ceramic-Materials
Materials
Porous-Ceramics
Reactor-Fuels

CERAMICS-RESEARCH
RF: Research

CERMETS
RF: Refractories

CESIUM
RF: Alkali-Metals
Light Metals
Light-Metal-Fuels

CHAMBER-ASSEMBLY

CHAMBER-MATERIALS
RF: Materials

CHAMBER-PRESSURES
SA: High-Chamber-Press
RF: Pressure

CHAMBER-SEALS
RF: Seals

CHAMBER-TECHNOLOGY

CHAMBERS
SA: Altitude-Test-Cham
Combustion-Chamber
Environmental-Cham
Heated-Chamber
Low-Pressure-Cham
Reaction-Chamber
Rocket-Chamber
Tartar-Plenum-Cham
Thrust-Chamber

CHANNEL
SA: Tapered-Channel
Towing-Channel

CHANNEL-CAPACITY

CHANNELED-FLOW
RF: Flow

Charcoal
S: Carbon

Charcoal-Activated
S: Activated-Carbon

CHARS
SA: Ablation-Chars
RF: Carbon-Formation

CHEMICAL-ADDITIVES
RF: Additives

CHEMICAL-ANALYSIS
SA: Borane-Analysis
Boron-Analysis
Ethyl-Analysis
FNA-Analysis
RF: Analysis

Chemical-Approaches
S: Chemical-Method

CHEMICAL-CONVERS
RF: Chemical-Conversion

Chemical-Conversion
S: Chemical-Convers

CHEMICAL-CORROSION
RF: Corrosion

CHEMICAL-FACTORS

CHEMICAL-HAZARDS
SA: Contamination
Decomposition
Explosion-Hazards
Fire-Hazards
Gaseous-Hazards
Health-Hazards
Liquid-Hazards
RF: Hazards
Military-Chemicals

CHEMICAL-IGNITERS
RF: Igniters

CHEMICAL-KINETICS
RF: Kinetics

CHEMICAL-METHOD
RF: Chemical-Approaches

CHEMICAL-MILLING
RF: Forming
Metalworking
Milling

CHEMICAL-PHENOMENA

CHEMICAL-PREP
RF: Chemical-Preparation

Chemical-Preparation
S: Chemical-Prep

CHEMICAL-PROCESSES

CHEMICAL-PROCESSING
RF: Processing

CHEMICAL-REACTION
SA: Adducts
Borane-Reactions
Catalysis
Diborane-Reaction
Heat-of-Reaction
Hydrogen-Reaction
Sodium-Reactions
RF: Reaction

CHEMICAL-RESEARCH
RF: Chemical-Studies
Research

CHEMICAL-SAFETY
RF: Safety
Toxicity

CHEMICAL-SCRUBBING
RF: Scrubbing

CHEMICAL-SOLUTIONS
SA: Heat-of-Solution
RF: Solutions

CHEMICAL-STABILITY
RF: Stability

CHEMICAL-STRUCTURE
RF: Structures

Chemical-Studies
S: Chemical-Research

CHEMICAL-SYNTHESIS
SA: Decane
Diborane-Synthesis
RF: Synthesis

CHEMICAL-SYSTEMS

CHEMICAL-TECHNIQUE

CHEMISTRY
SA: Analytical-Chem
Combustion-Chem
Difluoramine-Chem
Flame-Chemistry
Fluorine-Chemistry
High-Pressure-Chem
Inorganic-Chem
Ion-Chemistry
Military-Chemicals
Organic-Chemistry
Oxidizer-Chemistry
Photochemistry
Physical-Chemistry

Propellant-Chem
Rare-Gas-Chem
Synthetic-Chem
Thermochemistry

CHLORIDES
SA: Al-Chloride
Allyl-Chloride
Ca-Chloride
Copper-Chloride
Cyanuric-Chloride
Ethyl-Chloride
Ferric-Chloride
Hydrogen-Chloride
Isopropyl-Chloride
Li-Chloride
Mercuric-Chloride
Methyl-Chloride
Methylene-Chloride
Polyvinyl-Chloride
Potassium-Chloride
Propargyl-Chloride
Sodium-Chloride
Titanous-Chloride
Trichlorides
Vinyl-Chloride
Zinc-Chloride

CHLORINATED-RUBBER
RF: Rubber

CHLORINE

CHLORINE-COMPOUNDS
RF: Compounds

CHLORINE-STORAGE
RF: Storage

CHLORINE-TRIFLUOR
RF: Chlorine-Trifluoride
Liquid-Oxidizers

Chlorine-Trifluoride
S: Chlorine-Trifluor

CHROMIC-ACID
RF: Acids

CHROMITE
RF: Refractories

CHROMIUM
RF: Refractory-Metals

Chromium-Acetzl-Acetonate
S: Acetylacetonate-Cr

CHROMIUM-ALLOY
RF: Alloys

CHROMIUM-BORIDE
RF: Borides

CHROMIUM-CARBIDE
RF: Carbides

CHROMIUM-COMPOSITE
RF: Composites

CHROMIUM-COMPOUNDS
RF: Compounds

CHROMIUM-DETERM
RF: Chromium-Determination

Chromium-Determination
S: Chromium-Determ

CHROMIUM-OXIDE
RF: Refractories

CIRCULAR-ORBITS
RF: Orbits

CLADDING
SA: Coatings

CLEANING
SA: Descaling

Clear-Air-Turbulence
S: CAT

CLOUDS
SA: Exhaust-Clouds
RF: Atmosphere

CLUSTERING-STRUCT
RF: Clustering-Structure
Structures

Clustering-Structure
SA: Clustering-Struct

CLUSTERING-TECH
RF: Clustering-Technique

Clustering-Technique
S: Clustering-Tech

CLUSTERS
SA: Plug-Cluster
Rocket-Cluster

COATED-THIN-SHEETS
RF: Thin-Sheets

COATING-MATERIALS
RF: Materials

COATING-STUDIES
RF: Studies

COATING-SYSTEMS

COATING-TECHNIQUES

COATINGS
SA: Anodized-Coatings
Boron-Coatings
Carbide-Coatings
Carbon-Coatings
Cellulose-Acetate
Ceramic-Coatings
Corrosion-Protect
Deposits
Electrocationgs
Electrodeposition
Extrusion-Coatings
Ignition-Coatings
Insulation
Iridium-Coatings
Organic-Coatings
Oxidation-Protect
Paints
Protective-Coating
Reflective-Coating
Refractory-Coating
Thermal-Protection
Vacuum-Deposition
Zinc-Coatings
RF: Ablation-Materials
Cladding
Encapsulation
Finishes

Coatings-for-Aerospace-Environment
S: Relective-Coating
Vacuum-Effects

COAXIAL-FLOW
RF: Flow

COAXIAL-INJECTION
RF: Fuel-Injection
Injection

COAXIAL-JET-MIXING
RF: Jet-Mixing

COBALT

COBALT-60

COBALT-ALLOYS

COBALT-AMMINE

COBALT-IGNITION
RF: Ignition

COBALT-PROPERTIES

COEFFICIENT-DETERM
RF: Coefficient-Determination

Coefficient-Determination
S: Coefficient-Determ

COEFFICIENTS
SA: Accommodation Coef
Discharge-Coef
Temperature-Coef

COLD-FLOW
RF: Flow

COLD-VALVES
RF: Valves

COLD-WELDING
RF: Welding

COLD-WORKED-STEELS
RF: Steels

COLEMANITE

COLLOIDAL-PROPEL
RF: Colloidal-Propellants
Propellants

Colloidal-Propellants
S: Colloidal-Propel

Collidal-Suspensions
S: Suspensions

COLUMBIUM
RF: Niobium
Refractory-Metals

COLUMBIUM-ALLOY
RF: Alloys

COLUMBIUM-BORIDE
RF: Borides

COLUMBIUM-OXIDAT
RF: Columbium-Oxidation

Columbium-Oxidation
S: Columbium-Oxidat

COLUMBIUM-PROP
RF: Columbium-Properties

Columbium-Properties
S: Columbium-Prop

COLUMBIUM-PROTECT
RF: Columbium-Protection

Columbium-Protection
S: Columbium-Protect

COLUMBIUM-TECH
RF: Columbium-Technology

Columbium-Technology
S: Columbium-Tech

COLUMBIUM-WELDING
RF: Welding

COMBUSTIBLE-CASES
RF: Consumable-Cases
Materials

COMBUSTIBLES
RF: Fuels
Materials

COMBUSTION
SA: Air-Fuel-Combust
Al-Combustion
Ammonia-Combustion
Borane-Combustion
Boron-Combustion
Carbon-Combustion
Deflagration
Gas-Combustion
Heat-of-Combustion
Hybrid-Combustion
Hydrocarbon-Combus
Light-Metal-Combus
Nuclear-Combustion
Precombustion
Slow-Combustion
Spray-Combustion
Staged-Combustion
RF: Deflagration

COMBUSTION-AERODY
RF: Aerodynamics
Combustion-Aerodynamics

Combustion-Aerodynamics
S: Combustion-Aerody

COMBUSTION-ANAL
RF: Analysis
Combustion-Analysis

Combustion-Analysis
S: Combustion-Anal

COMBUSTION-CHAMBER
SA: Ablation-Materials
RF: Chambers

COMBUSTION-CHARACT
RF: Combustion-Characteristics

Combustion-Characteristics
S: Combustion-Charact

COMBUSTION-CHEM
SA: Flame-Chemistry
RF: Chemistry
Combustion-Chemistry

Combustion-Chemistry
S: Combustion-Chem

COMBUSTION-DATA

COMBUSTION-EFFIC
RF: Combustion-Efficiency

Combustion-Efficiency
S: Combustion-Effic

COMBUSTION-GASES
RF: gases

COMBUSION-INSTAB
SA: Unstable-Combust
RF: Combustion-Instability
Instability
Unstable-Combust

Combustion-Instability
S: Combustion-Instab

COMBUSTION-KINETIC
RF: Kinetics

COMBUSTION-PHENOM
RF: Combustion-Phenomena

Combustion-Phenomena
S: Combustion-Phenom

COMBUSTION-PRESS
RF: Combustion-Pressure
Pressure

Combustion-Pressure
S: Combustion-Press

COMBUSTION-PROBLEM

COMBUSTION-PROCESS

COMBUSTION-PRODUCT

COMBUSTION-RATES

COMBUSTION-REACT
RF: Combustion-Reactions
Reaction

Combustion-Reactions
S: Combustion-React

COMBUSTION-REQUIRE
RF: Combustion-Requirements

Combustion-Requirements
S: Combustion-Require

COMBUSTION-SAFETY
RF: Safety

COMBUSTION-STUDIES
RF: Studies

COMBUSTION-SYSTEMS

COMBUSTION-TEMP
RF: Combustion-Temperature
Temperature

Combustion-Temperature
S: Combustion-Temp

COMBUSTION-TESTS
RF: Tests

COMBUSTION-WAVES
RF: Waves

COMBUSTORS

COMMAND-CONTROL
RF: Control-Systems

COMMAND-GUIDANCE
RF: guidance

COMMAND-MODULE
SA: LEM
RF: Apollo

COMMUNICATIONS
SA: Telemetry

COMPONENT-TESTS
RF: Tests

COMPONENTS
SA: Electrodes
Engine-Components
Fittings
Missile-Components
Rocket-Components

Composite-Materials
S: Composites

COMPOSITE-PROPEL
RF: Composite-Propellants
Propellants

Composite-Propellants
S: Composite-Propel

COMPOSITES
SA: Carbide-Composites
Chromium-Composite
Fiber-Composites
Refractory-Composites
RF: Ablation-Materials

COMPOUNDS
SA: Acetylene-Compound
Ammonia-Compounds
Aromatic-Compounds
B-H-C-N-Compounds
Be-Compounds
Bi-Metallic-Comp
Boride-Compounds
Boron-Carbon-Comp
Boron-Compounds
Carbon-Compounds
Carbonyl-Compounds
Chlorine-Compounds
Chromium-Compounds
Cyano-Compounds
Deuterium-Compound
Difluoramino-Comp
Dimers
Domino-Compounds
Elastomeric-Comp
Explosive-Compound
Flu ine-Compounds
Fluoro-Nitro-Comp
Halogen-Compounds
High-Energy-Comp
Hydrazine-Compound
Intermetallic-Comp
Lead-Compounds
Lithium-Compounds
N-F-Compounds
Nitrogen-Compounds
Organic Compounds
Potassium-Compound
Rare-Gas-Compounds
Rubber-Compounds
Sulfur-Compounds
RF: Admixture

COMPRESSED-AIR
RF: Air

COMPRESSED-GASES
RF: gases

COMPRESSED-GAS-GUN
RF: guns

COMPRESSIBLE-FLOW
RF: Air
Flow

COMPRESSION
SA: Adiabatic-Compress

COMPRESSION-INVEST
RF: Compression-Investigations

Compression-Investigations
S: Compression-Invest

COMPRESSION-METHOD

COMPRESSION-SENSIT
RF: Compression-Sensitivity
Sensitivity

Compression-Sensitivity
S: Compression-Sensit

COMPRESSION-TESTS
RF: Tests

COMPRESSIVE-CREEP
SA: Creep-Buckling
RF: Creep

COMPRESSIVE-STRENG
RF: Compressive-Strength
Strength

Compressive-Strength
S: Compressive-Streng

COMPRESSORS

COMPUTATION
SA: Numerical-Solution

COMPUTER-PROGRAMS
SA: Fortran-Programs
Programming

COMPUTERS
SA: Analog-Computers
Calculators
Digital-Computers
RF: Calculators

CONDENSATION
RF: Liquid-Phase

CONDENSATION-EFFEC
RF: Condensation-Effects

Condensation-Effects
S: Condensation-Effec

CONDENSATION-KINET
RF: Condensation-Kinetics
Kinetics

Condensation-Kinetics
S: Condensation-Kinet

CONDOR
RF: Tactical-Missiles

CONDUCTION
SA: gas-Conduction

CONDUCTIVE-FILM
RF: Film
Igniters

CONDUCTIVITY
SA: Resistance
Semiconductivity

CONDUCTORS
SA: Superconductors

CONE-CHARGES
SA: Cylinder-Charges
RF: Shaped-Charges

CONES
SA: Exit-Cones
Insulated-Cones

CONFIGURATION
SA: Aerodynamic-Config

CONFIGURATION-MGT
RF: Configuration-Management
Management

Configuration-Management
S: Configuration-Mgt

CONFINED-VORTEX
RF: Vortex

CONICAL-NOZZLES
RF: Nozzles

CONNECTOR-DESIGN
RF: Design

CONNECTOR-SYSTEM

CONNECTOS
RF: Leakage
Mechanical-Fitting

Considerations
S: Design-Consid
Kinetic-Consid
System-Consid

CONSTANTS
SA: Dielectric-Const
Elastic-Constants
Equilibrium-Const
Force-Constants

Consumable-Cases
S: Combustible-Cases

CONSUMPTION-RATE
SA: Burning-Rate
RF: Burning Rate

CONTACT-RESISTANCE
RF: Electrical-Contact
Resistance

CONTAINERS
RF: Tanks

CONTAMINANTS
SA: Borane-Contaminant
FNA-Contaminants
Inorganic-Contam
Metallic-Contam
Microbial-Contam
RF: Corrosion

CONTAMINATION
SA: Acid-Contamination
Decontamination
RF: Chemical-Hazards
Decomposition
Decontamination

CONTROL-APPLICAT
RF: Control-Applications

Control-Applications
S: Control-Applicat

CONTROL-SYSTEMS
SA: Attitude-Control
Boundary-Layer-Con
Burning-Rate-Con
Command-Control
Damage-Control
Detonation-Control
Diffusion-Control
Engine-Control
Feedback
Flight-Control
Flow-Control
Fluid-Power-Con
gravity-Control
guidance
Jet-Control-Vanes
Launch-Control
Satellite-Control
Spacecraft-Control
Temperature-Con
Thermal-Control
Vector-Control
Zero-G-Control

CONTROL-TECHNIQUES
SA: Hot-gas-Injection

CONTROL-THEORY

CONTROLS
SA: Adaptive-Controls
Impulse-Control
Manual-Control
Peripheral-Control
Reaction-Control
Servomechanisms
Strobe-Control
Thrust-Control
Vortex-Control

CONTROLS-RESEARCH
RF: Research

Conventional-Aircraft
S: Aircraft

Convergent-Divergent-Nozzles
S: Nozzles

CONVERSION
SA: Borane-Conversion
Catalytic-Conversion
Energy-Conversion

CONVERSION-FACTORS

CONVERSION-KINETIC
RF: Kinetics

CONVERSION-TIMES

Convolutional-Mapping
S: Mapping

COOLANTS
SA: Nozzle-Coolants
Reactor-Coolant
RF: Cryocooler-Tech

COOLING
SA: Aftercooling
Afterglow-Cooling
Film-Cooling
Motor-Cooling
Radiation-Cooling
Regenerative-Cool
Spray-Cooled
Sweat-Cooling
Transpiration-Cool
Wall-Cooling

COOLING-DATA

COOLING-TESTS
RF: Tests

COPPER-ALLOY
SA: Brass
Bronze
RF: Alloys

COPPER-CHLORIDE
RF: Chlorides

CORDITE
SA: Macerated-Cordite
RF: ABC-Cordite

CORPORAL-MISSILE
RF: Missile

CORPORAL-PROPEL
RF: Corporal-Propellant
Propellants

Corporal-Propellant
S: Corporal-Propel

CORROSION
SA: Al-Corrosion
Be-Corrosion
Chemical-Corrosion
Contaminants
FNA-Corrosion
IRFNA-Corrosion
Metal-Corrosion
Protective-Coatings
Stress-Corrosion
Titamium-Corrosion
RF: Alloys
Metals

CORROSION-DATA

CORROSION-EFFECTS

CORROSION-FATIGUE
RF: Fatigue

CORROSION-INHIBIT
RF: Corrosion-Inhibition
Corrosion-Inhibitors

Corrosion-Inhibition
S: Corrosion-Inhibit

Corrosion-Inhibitors
S: Corrosion-Inhibit

CORROSION-PRODUCTS

CORROSION-PROP
RF: Corrosion-Properties

Corrosion-Properties
S: Corrosion-Prop

CORROSION-PROTECT
RF: Coatings
Corrosion-Protection
Protection

Corrosion-Protection
S: Corrosion-Protect

CORROSION-RATES

CORROSION-RESIST
RF: Corrosion-Resistance
Resistance

Corrosion-Resistance
S: Corrosion-Resist

CORROSION-STUDIES
RF: Studies

CORROSION-TESTING
RF: Tests

COST-ANALYSIS
RF: Analysis
Management

COST-COMPARISON

COST-EFFECTIVENESS

COST-ESTIMATE

COST-FACTORS

COSTING-METHODS

COSTS
SA: Booster-Costs
Engine-Costs
Low-Cost
Payload-Cost
Production-Costs
Propulsion-Costs
Saturn-Costs
Spacecraft-Costs
System-Costs
Tooling-Costs

COUNTERMEASURES
SA: Interceptors
RF: Active-Defense
Missile-Defense

CRACK-PROPAGATION
RF: Fatigue

CRASH-FIRES
RF: Accidents
Aircraft-Crash-Fires
Fire-Hazards
Fires

CREEP
SA: Al-Creep
Compressive-Creep
Fatigue-Creep
Intermittent-Creep
Short-Time-Creep

CREEP-BUCKLING
RF: Buckling
Compressive-Creep

CREEP-BEHAVIOR

CREEP-DATA

CREEP-PROPERTIES

CREEP-RUPTURE
RF: Fracture

CRITICAL-PRESSURE
RF: Pressure

CRITICAL-TEMP
RF: Critical-Temperatures
Temperature

Critical-Temperatures
S: Critical-Temp

CROSS-WIND-DEFLECT
RF: Cross-Wind-Deflection
Wind

Cross-Wind-Deflection
S: Cross-Wind-Deflect

CRUCIFORM-GRAINS
RF: grains
Star-grains

CRYOCOOLER-TECH
SA: Coolants
Refrigerants
RF: Cryocooler-Technology

Cryocooler-Technology
S: Cryocooler-Tech

CRYOGENIC-BLADDERS
RF: Bladders

Cryogenic-Boost-Tanks
S: Boost-Tanks

Cryogenic-Containers
S: Cryogenic-Tanks

CRYOGENIC-DATA

CRYOGENIC-ENVIRON
RF: Cryogenic-Environments
Environments

Cryogenic-Environment
S: Cryogenic-Environ

Cryogenic-Fluids
S: Cryogenic-Liquids

Cryogenic-Hydrogen
S: Liquid-Hydrogen

CRYOGENIC-LIQUIDS
RF: Cryogenic-Fluids
Liquid-Hazards

CRYOGENIC-MATERIAL
RF: Materials

CRYOGENIC-PROPEL
RF: Cryogenic-Propellants
Liquid-Propellants

Cryogenic-Propellants
S: Cryogenic-Propel

CRYOGENIC-PUMPS
RF: Pumps

CRYOGENIC-RESEARCH
RF: Research

CRYOGENIC-SEALS
RF: Seals

CRYOGENIC-TANKS
RF: Cryogenic-Containers
Tanks

CRYOGENIC-TEMP
SA: Low-Temperatures
RF: Low-Temperature
Temperature

Cryogenic-Temperatures
S: Cryogenic-Temp

CRYOGENICS
SA: Low-Temperature

CRYSTALLINE-EXPLOS
RF: Crystalline-Explosives
Explosives

Crystalline-Explosives
S: Crystalline-Explor

CRYSTAL-STRUCTURE
RF: Structures

CRYSTALLIZATION

CRYSTALS

CUCKOO-MOTOR
RF: Motors

CURING
SA: Propellant-Curing

CURING-CYCLE

CURVES
SA: Performance-Curves

CUTTING-FLUIDS
RF: Fluids
Lubricants

CYANAMIDE

CYANIDE

CYANO-COMPOUNDS
RF: Compounds

CYANURIC-CHLORIDE
RF: Chlorides

CYCLIC-LOADS
RF: Loads

CYCLIC-TEMPERATURE
RF: Temperature

CYLINDER-CHARGES
RF: Cone-Charges

CYLINDER-STRUCTURE
RF: Structures

CYLINDERS
SA: Hollow-Cylinders
Sandwich-Cylinder
Thrust-Cylinders

CYLINDRICAL-SHELL
RF: Shells

CYLINDRICAL-TANKS
RF: Tanks

DACRON
RF: Fibers

DAMAGE-CONTROL
RF: Accidents
Control-Systems

DAMPING
SA: Moments-of-Inertia

DATA-ACCUMULATOR
RF: Accumulator

DATA-ACQUISITION

DATA-COLLECTION

DATA-HANDLING

DATA-PROCESSING
SA: Documentaion

DATA-REDUCTION
RF: Reduction

DATA-SHEETS
RF: Sheets

DECABORANE
RF: Borane

DECANE
RF: Chemical-Synthesis

DECODING

DECOMPOSITION
SA: Ammonia-Decompsit
Autodecomposition
Contamination
FNA-Decomposition
Thermal-Decomp
RF: Chemical-Hazards

DECOMPOSITION-BURN
RF: Burning
Decomposition-Burning

Decomposition-Burning
S: Decomposition-Burn

DECOMPOSITION-CHAM
RF: Decomposition-Chamber

Decomposition-Chamber
S: Decomposition-Cham

DECOMPOSITION-MECH
RF: Decomposition-Mechanisms

Decomposition-Mechanisms
S: Decomposition-Mech

DECOMPOSITION-PRES
RF: Decomposition-Pressure

Decomposition-Pressure
S: Decomposition-Pres

DECOMPOSITION-PROD
RF: Decomposition-Products

Decomposition-Products
S: Decomposition-Prod

DECONTAMINATION
SA: Contamination
Propellant-Spills
RF: Chemical-Hazards
Contamination
Hazard-Control
Safety-Precautions

DECOYS
RF: Missile-Defense

DEFENSE
SA: Active-Defense
Early-Warning-Sys
FAADS
Missile-Defense

DEFENSE-METALS
RF: Metals

DEFLAGRATION-WAVE
RF: Waves

DEFLAGRATION
SA: Combustion
RF: Combustion

DEFLECTION
SA: Exhaust-Deflection
Flame-Deflector
Jet-Deflection

DEFORMATION
SA: Metal-Deformation
RF: Buckling

DEGASSING
SA: Vacuum-Degassing
RF: gas-Film

DEGRADATION
SA: Deterioration
Thermal-Degradat
RF: Aging
Deterioration

DEHYDRATION

DEKAZENE

DELTA-WINGS
RF: Wings

DEMONSTRATION-TEST
RF: Tests

DENSITY
SA: Bulk-Density
Flux-Density
High-Density
Loading-Density
Power-Density
Propellant-Density
Radiation-Density

DENSITY-RANGE

DEPOSITION
SA: Electrodeposition
Energy-Deposition
Vacuum-Deposition

DEPOSITS
RF: Coatings

DEPRESSANTS

DESCALING
RF: Cleaning

DESENSITIZATION
RF: Sensitivity

DESIGN
SA: Aderodynamic-Design
Connector-Design
Engine-Design
Grain-Design
Igniter-Design
Injector-Design
Mechanical-Design
Minuteman-Design
Motor-Design
Nozzle-Design
Optimum-Design
Parametric-Design
Reactor-Design
Saturn-Design
Seal-Design
Statistical-Design
Structural-Design
System-Design
Tank-Design
Vehicle-Design

DESIGN-CALCULATION

DESIGN-CONCEPT

DESIGN-CONSID
RF: Considerations
Design-Considerations
Human-Factors

Design-Considerations
S: Design-Consid

DESIGN-CRITERIA

DESIGN-DATA

DESIGN-GUIDE

DESIGN-PARAMETERS

DESIGN-PROGRAM

DESIGN-SELECTION
RF: Planning

DESIGN-STUDIES
RF: Studies

DESIGN-TECHNIQUES

DESIGNATIONS

DETECTION
SA: Cavitation-Detect
Fire-Detection
Flaw-Detection
Infrared-Detection
Leak-Detection
Vapor-Detection

DETECTION-SYSTEM

DETECTOR
SA: Borane-Detector
Emission-Detectors
Flame-Detector
Flaw-Detector

DETERIORATION
SA: Degradation
RF: Degradation

DETONATING-CORD
RF: Igniters

DETONATING-GASES
RF: gases

DETONATION
SA: Al-Detonation
Explosion
Shock-Attenuation
Vapor-Detonation
RF. Explosion

DETONATION-BEHAV
RF: Detonation-Behavior

Detonation-Behavior
S: Detonation-Behav

DETONATION-CHARACT
RF: Detonation-Characteristics

Detonation-Characteristics
S: Detonation-Charact

DETONATION-CONTROL
RF: Control-Systems

DETONATION-HAZARD
RF: Explosion-Hazards

DETONATION-PARAM
RF: Detonation-Parameters

Detonation-Parameters
S: Detonation-Param

DETONATION-PREVENT
RF: Detonation-Prevention

Detonation-Prevention
S: Detonation-Prevent

DETONATION-REACT
RF: Detonation-Reaction
Reaction

Detonation-Reaction
S: Detonation-React

DETONATION-SENSIT
RF: Detonation-Sensitivity
Sensitivity

Detonation-Sensitivity
S: Detonation-Sensit

DETONATION-SPEED
RF: Speed

DETONATION-STUDIES
RF: Studies

DETONATION-TESTS
RF: Tests

DETONATION-WAVES
RF: Waves

Detonators
S: Igniters

DEUTERIUM
RF: Hydrogen-Isotope

DEUTERIUM-COMPOUND
RF: Compounds

DEUTERIUM-FUEL
RF: Nuclear-Fuels

DEUTEROMETHANES

DIACETONE-ALCOHOL
RF: Alcohol

DIACETYL
RF: Ketones

DIACETYLENE
RF. Acetylene

Dialkylchloroborane
S: Alkylchloroborane

DIAMINE
RF: Amines

DIAMINOBUTENE

DIAPHANOUS-II-SYS
RF: Diaphanous-II-System
Fortran-Programs

Diaphanous-II-System
S: Diaphanous-II-Sys

DIAPHRAGMS
SA: Metal-Diaphragms
Tantalum-Diaphragm
RF: Fuel-Tanks

DIATOMIC-GASES
RF: gases

DIAZIRINE

DIAZO-COUPLING

DIAZODINITROPHENOL

DIBORANE
SA: Borane
RF: Boroethane
Borane

DIBORANE-HAZARD
RF: gaseous-Hazard

DIBORANE-OXIDATION

DIBORANE-PREP
RF: Diborane-Preparation

Diborane-Preparation
S: Diborane-Prep

DIBORANE-PURIFICAT
RF: Diborane-Purification

Diborane-Purification
S: Diborane-Purificat

DIBORANE-PVT-PROP
RF: Diborane-Pressure-Volume-Temperature-Properties

Diborane-Pressure-Volume-Temperature-Properties
S: Diborane-PVT-Prop

DIBORANE-PYROLYSIS

DIBORANE-REACTIONS
RF: Chemical-Reaction

DIBORANE-RECOVERY
RF: Recovery

DIBORANE-SOLUBIL
RF: Diborane-Solubility
Solubility

Diborane-Solubility
S: Diborane-Solubil

DIBORANE-SYNTHESIS
RF: Chemical-Synthesis

DIBUTYL-PHTHALATES
RF: Phthalates

DIBUTYLAMINE
RF: Amines

DIBUTYLBORATE

DIELECTRIC-CONST
RF: Constants
Dielectric-Constants

Dielectric-Constants
S: Dielectric-Const

DIELECTRIC-HEATING
RF: Heating

DIESEL-FUELS
RF: Fuel-Oil
Fuels

DIETHANOLAMINE
RF: Amines

DIETHYLAMINE
RF: Amines

DIFFERENTIAL-ANAL
RF: Analysis-Technique
Differential-Analysis

Differential-Analysis
S: Differential-Anal

DIFFRACTION
SA: X-Ray-Diffraction

DIFFUSER-STUDIES
RF: Studies

DIFFUSERS
SA: Dump-Diffuser
Exhaust-Diffusers

DIFFUSION
SA: gaseous-Diffusion
Thermal-Diffusion

DIFFUSION-BONDING
RF: Bonding

DIFFUSION-CONTROL
RF: Control-Systems

DIFFUSION-EFFECT

DIFFUSION-FLAMES
RF: Flames

DIFFUSIVE-BURNING
RF: Burning

DIFLUORAMINE
RF: Fluoro-Nitro-Comp.

DIFLUORAMINE-CHEM
RF: Chemistry
Difluoramine-Chemistry

Difluoramine-Chemistry
S: Difluoramine-Chem

DIFLUORAMINO-COMP
RF: Compounds
Difluoramino-Compounds

Difluoramino-Compounds
S: Difluoramino-Comp

DIGITAL-COMPUTERS
RF: Computers

DIGITAL-SYSTEMS
RF: Flight-Control

DIGITAL-TRANSDUCER
RF: Transducers

DIHALIDES
RF: Halides

Dihydropentaborane
S. Pentaborane

DIISOCYANATE

DILUENTS

DIMERS
RF: Compounds

Dimethyl-Carbinol
S: Isopropyl-Alcohol

DIMETHYL-ESTER
RF: Esters

Dimethyl-Ether
S: Methyl-Ether

DIMETHYL-HYDRAZINE
SA: UDMH
RF: Hydrazine

Dimethyl-Ketone
S: Acetone

DIMETHYL-SULFATE

DIMETHYLAMINE
RF: Amines

Dimethylene-Methane
S: Propadiene

DINITRO-ETHANE

DIOXIDES
SA: Butadiene-Dioxide
Carbon-Dioxide
Hydrogen-Dioxide
Nitrogen-Dioxide

DIPHENYLAMINE
RF: Amines

DISCHARGE
SA: Electric-Discharge
gas-Discharge

DISCHARGE-COEF
RF: Coefficients
Discharge-Coefficients

Discharge-Coefficients
S: Discharge-Coef

DISTILLATES
SA: Kerosene

DISTILLATION
SA: Evaporation
Fractional-Distill

DOCKING
RF: Orbital-Mechanics
Rendezvous
Space-Docking
Space-Maneuvering

DOCUMENT-RETRIEVAL
SA: Indexes
RF: Documentation
Information-Retrieval

DOCUMENTATION
SA: Document-Retrieval
Literature
RF: Data-Processing
Indexes

DOMINO-COMPOUNDS
RF: Compounds

DOPPLER-NAVIGATION
RF: Navigation

DOUBLE-BASE-PROPEL
RF: Double-Base-Propellants
Propellants

Double-Base-Propellants
S: Double-Base-Propel

DOUBLE-BURNING
RF: Burning

DRAG
SA: Low-Drag
Supersonic-Drag
RF: Aerodynamics
Projectiles
Streamlined-Bodies

DRAG-FUNCTIONS
RF: Functions

DRAG-REDUCTION
RF: Reduction

DROP-TANK
RF: Tanks

DROPLETS
SA: Fuel-Droplets
RF: Atomization
Liquid-Droplet

DRUMS
SA: Fuel-Drums
Storage-Drums
RF: Tanks

DUAL-GRAIN-SYSTEMS
RF: grains

DUAL-THRUST-MOTOR
RF: Motors
Thrust

DUCTILE-ALLOYS
RF: Alloys

DUCTILITY
SA: Annealing

DUMP-DIFFUSER
RF: Diffusers

DYNAMIC-FLOW
RF: Flow

DYNAMIC-LOADS
RF: Loads

DYNAMIC-RESPONSE
RF: Structures

DYNAMIC-STABILITY
RF: Stability

EARLY-WARNING-SYS
RF: Defense
Early-Warning-Systems

Early-Warning Systems
S: Early-Warning-Sys

EARTH-ORBITS
RF: Orbits

EARTH-SATELLITES
RF: Satellites

EDGE-LOADING
RF: Loading

EIMITE
RF: Primers

EJECTION-SEAT
RF: Safety-Devices

EJECTORS
SA: Nozzle-Ejectors
Rocket-Ejector

ELASTIC-CONSTANTS
RF: Constants

ELASTIC-FILAMENTS
RF: Fibers

ELASTIC-MODULI
SA: Youngs-Modulus

ELASTIC-SEALS
RF: Seals

ELASTIC-SHELLS
RF: Shells

ELASTIC-STABILITY
RF: Stability

ELASTIC-STRUCTURES
RF: Structures

ELASTIC-SYSTEMS
RF: Shock-Isolation

ELASTICITY
SA: Viscoelasticity
Youngs-Modulus

ELASTOMERIC-BINDER
RF: Binders
Elastomers

ELASTOMERIC-COMP
SA: Rubber-Compounds
RF: Compounds
Elastomeric-Compounds

Elastomeric-Compounds
S: Elastomeric-Comp

ELASTOMERS
SA: Elastomeric-Binder
Polyurethane-Elast
Rubber
RF: Materials

ELECTRIC-DISCHARGE
RF: Discharge

ELECTRIC-HAZARDS
RF: Electromagnetic-Hazard
Hazards

ELECTRIC-PRIMERS
RF: Primers

ELECTRIC-PROPULS
RF: Electric-Propulsion
Propulsion

Electric-Propulsion
S: Electric-Propuls

ELECTRIC-SPARKS
RF: Sparks

ELECTRICAL-CONTACT
SA: Contact-Resistance

ELECTRICAL-CONTIN
RF: Electrical-Continuity

Electrical-Continuity
S: Electrical-Contin

ELECTRICAL-MEAS
RF: Electrical-Measurements

Electrical-Measurements
S: Electrical-Measure

ELECTRICAL-PHENOM
SA: Piezoelectricity
RF: Electrical-Phenomena

Electrical-Phenomena
S: Electrical-Phenom

ELECTRICAL-PROPERT
RF: Electrical-Properties

Electrical-Properties
S: Electrical-Propert

ELECTRICAL-RESIST
RF: Electrical-Resistance
Resistance

Electrical-Resistance
S: Electrical-Resist

ELECTRICAL-SYSTEMS
SA: Redundant-Circuits
Resistance-Networks

ELECTROCOATINGS
RF: Coatings

ELECTRODEPOSITION
RF: Coatings
Deposition

ELECTRODES
RF: Components

ELECTROEXPLOSIVES
RF: Explosives

ELECTROLYSIS

ELECTROLYTIC-CELL
RF: Cells
Power-Sources

Electromagnetic-Hazard
S: Electric-Hazards

ELECTRON-BEAM

ELECTRON-DONORS
RF: Energy-Sources

ELECTRON-BEAM-WELD
RF: Welding

ELECTRON-MICROSCOP
SA: Fractography
RF: Electron-Microscope

Electron-Microscope
S: Electron-Microscop

ELECTROSTATIC

ELEVATED-TEMP
RF: Elevated-Temperature
Temperature

Elevated-Temperature
S: Elevated-Temp

ELLIPSOIDAL-SHELLS
RF: Shells

EMISSION

EMISSION-DETECTORS
RF: Detector

EMISSION-SPECTRA
RF: Spectra

EMISSIVITY
SA: Reflectivity
RF: Radiation

EMITTANCE
SA: Spectral-Emittance

EMULSIONS
RF: Suspensions

ENAMELS
RF: Paints

ENCAPSULATION
SA: Coatings
Oxidizer-Encapsul

END-BURNING-MOTOR
RF: Motors

ENERGETIC-OXIDIZER
RF: Oxidizers

ENERGY
SA: Activation-Energy
Bond-Energy
Ignition-Energy
Radiant-Energy
Reaction-Energy
Solar-Energy
Sonic-Energy
Specific-Energy
Ultrasonic-Energy

ENERGY-CONVERSION
SA: Photovoltaic-Cells
RF: Conversion
Radiant-Energy-Conversion

ENERGY-DEPOSITION
RF: Deposition

ENERGY-RELEASE

ENERGY-SOURCES
SA: Electron-Donors
RF: Power-Sources
Source

ENERGY-TRANSFER

ENGINE
SA: Ace-Engine
Aerospike-Engine
Afterburner
Air-Breathing
Aircraft-Engines
Hybrid-Engine
Jet-Engine
Manifold
Motors
Nuclear-Engines
Plasma-Engine
Ramjet-Engine
Research-Engines
Rocket-Engine
Spacecraft-Engines
Static-Test-Firing
Thermojet-Engine
Turborocket-Engine
RF: Motors
Power-Sources

ENGINE-COMPONENTS
RF: Components

ENGINE-COSTS
RF: Costs

ENGINE-CYCLES

ENGINE-DESIGN
RF: Design

ENGINE-DYNAMICS

ENGINE-PARAMETERS

ENGINE-PERFORMANCE
RF: Performance

ENGINE-STUDIES
RF: Studies

ENGINE-SUBASSEMBLY
RF: Subassemblies

ENGINE-SUBSYSTEM
RF: Subsystem

ENGINE-SYSTEM

ENGINE-TESTING
RF: Tests

ENGINE-WEIGHTS
RF: Weight

ENGINEERING

ENTHALPY
RF: Heat-Content

ENTRAINED-GASES
RF: Gases

ENTROPY
RF: Thermodynamics

ENVIRONMENT
SA: Artificial-Environ
Cryogenic-Environ
Flow-Environment
Flox-Environment
High-G-Environment
Hyper-Environment
Low-G-Environment
Missile-Environ

Reactive-Environ
Space-Environment
Thermal-Environ
Vacuum-Environment

ENVIRONMENT-EFFECT

ENVIRONMENTAL-CHAM
RF: Chambers
Environmental-Chamber
Simulators

Environmental-Chamber
S: Environmental-Cham

ENVIRONMENTAL-TEST
RF: Tests

ENZYME-STUDIES
RF: Studies

EPOXIDE-RESIN
RF: Resins

Epoxide-Resin-Binders
S: Resin-Binders

EQUILIBRIUM-CONST
RF: Constants
Equilibrium-Constants

Equilibrium-Constants
S: Equilibrium-Const

EROSION
SA: Abration
Be-Erosion
Ceramic-Erosion
Nozzle-Erosion
Organic-Coatings
Powder-Gas-Erosion
Rain-Erosion
Thermal-Erosion
Throat-Erosion
RF: Abrasion

EROSIVE-BURNING
RF: Burning

ERROR-SOURCES
RF: Source

ESTERS
SA: Dimethyl-Ester
Nitrate-Esters
Phthalate-Ester

ETHANE

Ethane-Nitrile
S: Acetonitrile

Ethanoic-Anhydride
S: Acetic-Anhydride

Ethanol
S: Ethyl-Alcohol

ETHANOLAMINE
RF: Amines

Ethanoyl-Chloride
S: Acetyl-Chloride

EHTER
SA: Bromoethyl-Ethers
Ethyl-Ether
Methyl-Ether

ETHER-ALCOHOL
RF: Alcohol

ETHYL-ACETATE

ETHYL-ALCOHOL
RF: Alcohol
Ethanol
Methyl-Carbinol

ETHYL-ANALYSIS
RF: Chemical-Analysis

Ethyl-Carbinol
S: Propyl-Alcchol

ETHYL-CELLULOSE
RF: Cellulose
Cellulose-Acetate
Inhibitor-Material

ETHYL-CENTRALITE
RF: Centralite

ETHYL-CHLORIDE
RF: Chlorides

ETHYL-DECABORANE

ETHYL-DIBORANE

ETHYL-ETHER
RF: Ether

ETHYL-NITRATE
RF: Nitrate

ETHYLAMINE
RF: Amines

ETHYLENE
SA: Polyethylene

ETHYLENE-DIAMINE

ETHYLENE-GLYCOL
RF: Glycols

ETHYLENE-OXIDE

ETHYLENE-REACTIONS
RF: Gas-Reactions

Ethyne
S: Acetlyene

EUTECTIC-MELT
RF: Melting-Point

EVAPORATION
SA: Fuel-Evaporation
RF: Distillation

EVASIVE-SATELLITE
RF: Active-Defense
Satellites

EXHAUST
SA: Rocket-Exhaust

EXHAUST-CLOUDS
RF: Clouds

EXHAUST-DEFLECTION
RF: Deflection

EXHAUST-DIFFUSERS
RF: Diffusers

EXHAUST-DUCTING

EXHAUST-FLAME
RF: Flames

EXHAUST-GAS
RF: Gases

EXHAUST-GAS-EFFECT

EXHAUST-GAS-STREAM

EXHAUST-JETS
RF: Jets

EXHAUST-NOZZLE
RF: Nozzles

EXHAUST-PLUME
RF: Plumes

EXHAUST-PRODUCTS

EXHAUST-SPECIES

EXHAUST-STREAM

EXHAUST-VELOCITY
RF: Velocity

EXIT-CONES
RF: Cones

EXIT NOZZLES
RF: Nozzles

EXPANSION
SA: Adiabatic-Expans
Internal-Expansion
Jet-Expansion
Thermal-Expansion

Exploding-Bridgewire
S: Metal-Wire-Combust

Exploding-Wire
S: Metal-Wire-Combust

EXPLOSION
SA: Detonation
Heat-of-Explosion

Helium-Explosion
Manifold-Explosion
Nuclear-Explosion
Thermal-Explosions
RF: Accidental-Explosions
Accidents
Detonation

EXPLOSION-HAZARDS
SA: Blast-Hazard
Detonation-Hazard
RF: Chemical-Hazards
Fuel-Hazards
Hazards
Launching-Hazards
Propellant-Hazards
WS-Hazards

EXPLOSION-LIMITS

EXPLOSION-RESEARCH
RF: Research

EXPLOSIVE-ACTUATOR
RF: Actuators

EXPLOSIVE-CHARACT
RF: Explosive-Characteristics

Explosive-Characteristics
S: Explosive-Charact

EXPLOSIVE-COMPOUND
RF: Compounds
Explosives

EXPLOSIVE-FORMING
SA: Shock-Hardening
RF: Forming
Metalworking

EXPLOSIVE-INSTABIL
RF: Explosive-Instability
Instability

Explosive-Instability
S: Explosive-Instabil

EXPLOSIVE-LOADED
RF: Loading

EXPLOSIVE-OXIDAT
RF: Explosive-Oxidation
Oxidation

Explosive-Oxidation
S: Explosive-Oxidat

EXPLOSIVE-PHENOM
RF: Explosive-Phenomena

Explosive-Phenomena
S: Explosive-Phenom

EXPLOSIVE-REACTION
RF: Reaction

EXPLOSIVE-SENSIT
RF: Explosive-Sensitivity
Sensitivity

Explosive-Sensitivity
S: Explosive-Sensit

EXPLOSIVE-TESTS
RF: Tests

EXPLOSIVES
SA: Black-Powder
Crystalline-Explos
Electroexplosives
Explosive-Compound
High-Explosives
Liquid-Explosives
Plastisol-Explos
Pliable-Explosive
Trinitrotoluene
Underwater-Explos

EXPULSION
SA: Fuel-Expulsion
Mass-Expulsion
Propellant-Expuls

EXPULSION-BLADDERS
RF: Bladders

EXPULSION-SYSTEMS

EXPULSION-TANK
RF: Tanks

EXPULSION-TECH
RF: Expulsion-Techniques
Positive-Expulsion-Techniques

Expulsion-Techniques
S: Expulsion-Tech

EXTERNAL-BALLISTIC
RF: Ballistics

EXTERNAL-FLOW
RF: Flow

EXTERNAL-FORCES
RF: Forces

EXTERNAL-PRESSURE
RF: Pressure

EXTRUSION-COATING
RF: Coatings

FAADS
RF: Defense
Forward-Area-Air-Defense-System

FABRICATION
SA: Forging
Forming
Machining

FAILURE
SA: Fracture
Motor-Failure
Reliability

FAILURE-ANALYSIS
RF: Analysis
Reliability

FAILURE-MODES

FARADAY-METHOD

FAST-REACTORS
RF: Reactors

FATIGUE
SA: Al-Alloy-Fatigue
Corrosion-Fatigue
Crack-Propagation
Fracture
Notch-Sensitivity
Panel-Fatigue

FATIGUE-BEHAVIOR

FATIGUE-CREEP
RF: Creep

FATIGUE-EVALUATION
RF: Quality-Control

FATIGUE-MECHANISMS

FATIGUE-PROBLEMS

FATIGUE-PROPERTIES
RF: Metal-Properties

FATIGUE-STRENGTH
RF: Strength

FATIGUE-TESTS
RF: Tests

FEASIBILITY-TEST
RF: Tests

FEED-MATERIALS
RF: Materials

FEED-PUMPS
RF: Pressure-Fed
Pumps

FEED-SYSTEMS
SA: Gravity-Fed-Rocket
Propellant-Feed

FEED-TANKS
RF: Tanks

FEEDBACK
RF: Amplifiers
Control-Systems

FERRIC-CHLORIDE
  RF: Chlorides

FERRIC-IONS
  RF: Ions

FERRIC-OXIDE

FERROCENE
  SA: Vinyl-Ferrocene

FERROUS-ALLOYS
  RF: Alloys

FERROUS-SULFATE

FIBER-COMPOSITES
  RF: Composites

FIBERGLASS
  RF: Glass
  Glass-Fibers

FIBERGLASS-CASES

FIBERS
  SA: Carbon-Fibers
  Dacron
  Elastic-Filaments
  Glass-Fibers
  High-Modulus-Fiber
  Nylon
  Refractory-Fibers
  Reinforced-Fibers

FIBROUS-INSULATION
  RF: Insulation

FILAMENT-WINDING

FILAMENT-WOUND

FILAMENTS
  SA: Low-Cost-Filaments
  Whiskers

FILM
  SA: Conductive-Film
  Gas-Film
  Saran-Film

FILM-COOLED-NOZZLE
  RF: Film-Cooling
  Nozzles

FILM-COOLING
  SA: Film-Cooled-Nozzle
  RF: Cooling

FILTERS
  SA: Glass-Filters

FILTRATION
  SA: FNA-Filtration
  RF: Centrifuging

FIN-ASSEMBLIES

FIN-ATTACHMENTS

FINENESS-RATIO

Finishes
  S: Coatings
  Organic-Coatings

FINS
  SA: Longitudinal-Fins
  Rectangular-Fins

FIRE-DETECTION
  RF: Detection

Fire-Extinguishment
  S: Firefighting

FIRE-HAZARDS
  SA: Crash-Fires
  RF: Al-Hazards
  Chemical-Hazards
  Fires
  Friction-Spark-Ignition-Hazards
  Fuel-Hazards
  Hazards
  Launching-Hazards
  Propellant-Hazards

FIRE-PROTECTION
  RF: Protection
  Safety-Precautions

FIREFIGHTING
RF: Fire-Extinguishment

FIRES
SA: Crash-Fires
Fire-Hazard
Hydrogen-Fires
RF: Accidents

FISSION
SA: Gaseous-Fission

FISSION-HEATING
RF: Heating

FISSION-POWER
RF: Nuclear-Propulsion
Power

FISSION-PRODUCTS

FISSION-REACTOR
RF: Reactors

FITTINGS
SA: Mechanical-Fitting
Welded-Fittings
RF: Components

FLAME-ATTENUATION

FLAME-CHEMISTRY
RF: Chemistry
Combustion-Chem

FLAME-DEFLECTOR
RF: Deflection

FLAME-DETECTOR
RF: Detector

FLAME-FRONT

FLAME-INHIBITION

FLAME-PHENOMENA

FLAME-PLASMA
RF: Plasmas

FLAME-PROPAGATION
RF: Acetylene

FLAME-SPECTRA
RF: Spectra

FLAME-SPECTROSCOPY
RF: Spectroscopy

FLAME-SPEED
RF: Acetylene
Speed

SLAME-STABILITY
RF: Stability

FLAME-STUDIES
RF: Studies

FLAME-TEMPERATURE
RF: Temperature

FLAME-TUBE
RF: Tube

FLAMES
SA: Diffusion-Flames
Exhaust-Flame
Flash-Back
Hydrogen-Flames
Laminar-Flames
Metahne-Air-Flames
Propane-Air-Flames
Turbulent-Flame

FLAMMABILITY

FLAMMABILITY-LIMIT

FLARES
RF: Pyrotechnics

FLASH-BACK
RF: Flames

FLASH-WELDING
RF: Welding

FLAT-PLATES
  SA: Porous-Flat-Plate
  RF: Plates

FLAW-DETECTION
  RF: Detection
      Inspection

FLAW-DETECTOR
  RF: Detector

FLIGHT
  SA: Free-Flight
      High-Speed-Flight
      Hypersonic-Flight
      Long-Range-Flight
      Missile-Flight
      Orbital-Flight
      Supersonic-Flight
      Tow-Flight

FLIGHT-ANALYSIS
  RF: Analysis

FLIGHT-CONTROL
  SA: Altitude-Control
      Autopilot
      Digital-Systems
      Hot-Gas-Systems
  RF: Control-Systems
      Flight-Control
      Guidance
      Navigation

Flight-Control-Systems
  S: Flight-Control

FLIGHT-INSTRUMENTS
  SA: Accelerometer
      Gyroscopes
  RF: Inertial-Navigation
      Instruments
      Navigation

FLIGHT-MECHANICS
  RF: Mechanics

FLIGHT-OPERATIONS

FLIGHT-SAFETY-PROG
  RF: Flight-Safety-Program
      Safety-Programs

Flight-Safety-Program
  S: Flight-Safety-Prog

FLIGHT-SIMULATION
  RF: Simulation

FLIGHT-TESTS
  RF: Tests

FLOW
  SA: Adiabatic-Flow
      Axial-Flow
      Channeled-Flow
      Coaxial-Flow
      Cold-Flow
      Compressible-Flow
      Dynamic-Flow
      External-Flow
      Fluid-Flow
      Gas-Flow
      Hypersonic-Flow
      Jet-Driven-Flows
      Laminar-Flow
      Oscillatory-Flow
      Plastic-Flow
      Potential-Flow
      Primary-Flow
      Propellant-Flow
      Radial-Flow
      Reverse-Flow
      Secondary-Flow
      Shear-Flow
      Starting-Flow
      Subsonic-Flow
      Supersonic-Flow
      Transonic-Flow
      Turbulent-Flow
      Two-Phase-Flow
      Vortex-Flows

FLOW-ANALYSIS
  RF: Analysis

FLOW-CONTROL
  RF: Control-Systems

FLOW-ENVIRONMENTS
  RF: Environment

FLOW-FIELD

FLOW-PATTERNS

FLOW-RATE

FLOW-SEPARATION

FLOW-STABILITY
RF: Stability

FLOW-STUDIES
RF: Studies

FLOW-SYSTEM

FLOW-THEORY
RF: Theoretical-Flow

FLOW-VELOCITIES
SA: Viscosity
RF: Velocity

FLOW-VISUALIZATION

FLOWMETERS
RF: Instruments

FLOX
RF: Fluorine-Liquid-Oxygen
Oxidizers

FLOX-ENVIRONMENT
RF: Environment

FLOX-MIXTURES

FLUID-AMPLIFIERS
RF: Amplifiers
Fluidic-Generator

FLUID-BED-PROCESS

FLUID-FLOW
SA: Reynolds-Number
RF: Flow

FLUID-INJECTION
RF: Injection

FLUID-MECHANICS
RF: Mechanics

FLUID-NAVIGATION
RF: Accelerometers
Navigation
Navigation-Fluid

FLUID-OSCILLATIONS
RF: Oscillations
Sloshing

FLUID-POWER-CON
RF: Control-Systems
Fluid-Power-Control

Fluid-Power-Control
S: Fluid-Power-Con

FLUID-SYSTEMS

Fluid-Slosh
S: Sloshing

FLUIDIC-GENERATOR
RF: Fluid-Amplifiers
Generators

FLUIDS
SA: Cryogenic-Liquids
Cutting-Fluids
Hydraulic-Fluids
Liquids
Starting-Fluid
RF: Liquids

FLUOBORATE
SA: Sodium-Fluoborate

FLUORAMINE
RF: Amines

FLUORIDE
SA: Ca-Fluoride
Hydrogen-Fluoride
Li-Fluoride
Mercuric-Fluoride
Nitrogen-Fluoride
Pentafluoride
Potassium-Fluoride
Rare-Gas-Fluorides
Tetrafluoride
Trifluoride

FLUORINATION-TECH
RF: Fluorination-Techniques

Fluorination-Techniques
S: Fluorination-Tech

FLUORINE
SA: Boiling-Fluorine
Gaseous-Flurrine
Liquid-Fluorine

FLUORINE-CHEMISTRY
RF: Chemistry

FLUORINE-COMPOUNDS
RF: Compounds

FLUORINE-HAZARD
RF: Gaseous-Hazards
Oxidizer-Hazards

FLUORINE-OXIDIZERS
RF: Liquid-Oxidizers

Fluorine-Liquid-Oxygen
S: Flox

FLUORO-NITRO-COMP
SA: Acetamide
Butane
Butyric-Acid
Difluoramine
Pentane
RF: Compounds
Fluoro-Nitro-Compounds

Fluoro-Nitro-Compounds
S: Fluoro-Nitro-Comp

FLUOROCARBONS
RF: Carbon

FLUX
SA: Heat-Flux

FLUX-DENSITY
RF: Density

FNA-ANALYSIS
RF: Chemical-Analysis
Fuming-Nitric-Acid

FNA-CONTAMINANTS
RF: Contaminants
Fuming-Nitric-Acid

FNA-CORROSION
RF: Corrosion
Fuming-Nitric-Acid

FNA-DECOMPOSITION
RF: Decomposition
Fuming-Nitric-Acid

FNA-FILTRATION
RF: Filtration
Fuming-Nitric-Acid

FNA-VAPOR-PRESSURE
RF: Fuming-Nitric-Acid
Vapor-Pressure

FNA-PROPERTIES
RF: Fuming-Nitric-Acid

FNA-STORAGE
SA: Al-Corrosion
Al-RFNA-Corrosion
Al-Tanks
RF: Storage

FOAMS
SA: Sealed-Foam

FOLDING-FIN-ROCKET
RF: Rocket

FORCE-CONSTANTS
RF: Constants

FORCE-GAGES
RF: Gages

FORCE-MEASUREMENT
RF: Measurement

FORCE-TRANSDUCER
RF: Transducers

FORCES
SA: Aerodynamic-Forces
Axial-Forces
External-Forces
Shear

FORCING-FUNCTIONS
RF: Functions

FORGING
SA: Be-Forging
Metal-Deformation
RF: Fabrication

FORMABILITY
SA: Al-Formability
RF: Forming

FORMALDEHYDE
RF: Aldehydes

FORMAMIDE
RF: Amides

Formation
S: Bubble-Formation
Carbon-Formation
Heat-of-Formation
Slude-Formation
Spray-Formation

FORMING
SA: Be-Forming
Casting
Chemical-Milling
Explosive-Forming
Formability
Hot-Forming
Metalworking
Rolling
Stretch-Forming
RF: Fabrication

FORTRAN-PROGRAMS
SA: Diaphanous-II-Sys
RF: Computer-Programs

Forward-Area-Air-Defense-System
S: FAADS

FRACTIONAL-DISTILL
RF: Distillation
Fractional-Distillation

Fractional-Distillation
S: Fractional-Distill

FRACTOGRAPHY
RF: Electron-Microscop

FRACTURE
SA: Creep-Rupture
Stress-Rupture
RF: Failure
Fatigue

FRACTURE-MECHANICS
RF: Mechanics

FRACTURE-TOUGHNESS
RF: Metal-Properties
Strength

FREE-FLIGHT
RF: Flight

FREE-JETS
RF: Jets

FREE-MOLECULE
RF: Molecule

FREE-RADICALS
RF: Radicals

FREEZING
SA: Low-Freezing

FREEZING-POINT
SA: Low-Freezing-Point

FRICTION
SA: Internal-Friction
Skin-Friction
RF: Aerodynamics
Wear

Friction-Spark-Ignition-Hazards
S: Fire-Hazards

FUEL-ADDITIVES
SA: Anti-Coking
RF: Additives

FUEL-BINDERS
RF: Binders

FUEL-BLENDS

FUEL-BUCKLING
  RF: Buckling

FUEL-CAPSULE

FUEL-CELLS
  RF: Power-Sources

FUEL-COMPOSITION

FUEL-DROPLETS
  RF: Droplets

FUEL-DRUMS
  SA: Rubber-Fuel-Drums
  RF: Drums

FUEL-ELEMENTS

FUEL-EVALUATION
  RF: Qualification-Test

FUEL-EVAPORATION
  RF: Evaporation

FUEL-EXPULSION
  RF: Expulsion

FUEL-HAZARDS
  SA: Explosion-Hazards
      Fire-Hazards
      Health-Hazards
      Propellant-Hazards
  RF: Hazards
      Propellant-Hazards

FUEL-INJECTION
  SA: Coaxial-Injection
  RF: Injection
      Propulsion-Systems

FUEL-LOSSES
  RF: Losses

FUEL-MATERIALS
  RF: Materials

FUEL-MOTION
  RF: Sloshing

FUEL-OIL
  SA: Diesel-Fuels

FUEL-ORIFICE
  RF: Orifices

FUEL-OSCILLATIONS
  RF: Sloshing

FUEL-PIPE

FUEL-SUBSTITUTE

FUEL-SWELLING

FUEL-SYSTEMS
  SA: Manifold

FUEL-TANKS
  SA: Aircraft-Fuel-Tank
      Bladders
      Boost-Tanks
      Booster-Tank
      Diaphragms
      Missile-Fuel-Tanks
      Pistons
      Tank-Liners
  RF: Tanks

FUEL-TEMPERATURE
  RF: Temperature

FUEL-TESTS
  SA: Alcohol-Fuel-Tests
  RF: Tests

FUEL-TOXICITY
  RF: Toxicity

FUEL-TUBES
  RF: Tube

FUEL-VISCOSITY
  RF: Viscosity

FUELING
  SA: Refueling

FUELS
SA: Aircraft-Fuels
AN-F-58-Fuel
Atomized-Fuel
Combustibles
Diesel-Fuels
Graphite-Fuel
High-Energy-Fuel
Hybaline-A5-Fuel
Hydrazine-Fuel
Hydrocarbon-Fuels
Jet-Fuel
JP-4-Fuel
JP-5-Fuel
JPX-Fuel
Kerosene-Type-Fuel
Light-Metal-Fuels
Liquid-Fuels
Metallic-Fuel
Monofuels
Nuclear-Fuels
Organoborane-Fuel
Propellants
Reactor-Fuel
Rocket-Fuels
Rover-Fuel
Rubber-Fuel-Base
Solid-Propellants
Slurry-Fuels
Super-Fuels
Turbine-Fuels
Turborocket-Fuel

FULL-POWER-RUN
RF: Tests

FUME-CONTROL
SA: Leak-Detection
Vapor-Detection
RF: Hazard-Control

FUMES

FUMING-NITRIC-ACID
SA: FNA-
Gaseous-FNA
IRFNA
IWFNA
RFNA
WFNA
RF: Nitric-Acid

FUNCTIONS
SA: Drag-Functions
Forcing Functions
Prandtl-Meyer-Func
Thermodynamic-Func

FURFURAL
RF: Aldehydes

FURFURYL-ALCOHOL
RF: Alcohol

FURNACES
SA: Arc-Image-Furnace
Induction-Heating

FUSED-SALT
RF: Salts

FUSION
SA: Heat-of-Fusion

FUSION-WELDING
RF: Welding

GAGES
SA: Force-Gages
Liquid-Level-Gages
Piezo-Gages
Pressure-Gages
Strain-Gage
Stress-Gage
RF: Instruments

GALCIT-65
RF: Asphalt

GAMMA-DOSE-RATE

GAMMA-RADIATION
RF: Radiation

GAMMA-RAY

GAMMA-RAY-HEATING
RF: Heating

GAS-ADSORPTION
RF: Adsorption

GAS-ANALYSIS
SA: Acetylene-Analysis
RF: Analysis

GAS-BREAKDOWN

GAS-CHROMATOGRAPHY
RF: Analysis-Technique

GAS-COMBUSTION
SA: Carbon-Black
Hydrogen-Combust
RF: Combustion

GAS-COMPOSITION

GAS-CONDUCTION
RF: Conduction

GAS-DISCHARGE
SA: R-F-Gas-Discharge
RF: Discharge

GAS-DYNAMICS
SA: Mollier-Charts

GAS-FILM
SA: Degassing
RF: Film

GAS-FLOW
SA: Adiabatic-Flow
RF: Flow

GAS-GENERATION
SA: Aerogens

GAS-GENERATOR
RF: Generators

GAS-KINETICS
RF: Kinetics

GAS-MASK-CANISTERS

GAS-METAL-REACTION
RF: Reaction

GAS-MIXTURES
RF: Mixture

GAS-OPERATED

GAS-PERMEABILITY
RF: Permeability

GAS-PHASE

GAS-PRESSURE
RF: Pressure

GAS-PRESSURIZATION
RF: Pressurization

GAS-REACTIONS
SA: Ethylene-Reactions
RF: Reaction

GAS-SEPARATORS

GAS-SUPPLY

GAS-TURBINES
RF: Turbines

GAS-VALVES
RF: Valves

GASEOUS-BORANE
RF: Borane

GASEOUS-DIFFUSION
RF: Diffusion

GASEOUS-FISSION
RF: Fission

GASEOUS-FLUORINE
RF: Fluorine

GASEOUS-FNA
RF: Fuming-Nitric-Acid

GASEOUS-HAZARDS
SA: Acetylene-Hazard
Ammonia-Hazard
Diborane-Hazard
Fluorine-Hazard
Hydrogen-Hazard
Oxygen-Hazard
Ozone-Hazard
RF: Chemical-Hazards

GASEOUS-HYDROGEN
RF: Hydrogen
Joul-Thomson-Eff

GASOUES-INJECTION
SA: Hot-Gas-Injection
RF: Injection

GASES
SA: Argon
Combustion-Gases
Compressed-Gases
Detonating-Gases
Diatomic-Gases
Entrained-Gases
Exhaust-Gases
Gray-Gas
Heavy-Gas
Helium
Hot-Gas-Blow-Down
Hot-Gas-Ignition
Hot-Gas-Primer
Hydrogen
Ideal-Gas-Theory
Knudsen-Gas
Nitrogen
Noble-Gas
Oxygen
Ozone
Phosgene
Powder-Gases
Propellant-Gas
Rare-Gas-Compounds

GASKETS
SA: Seals
RF: Leakage
Seals

GASOLINE
RF: Aircraft-Fuels

GELLED-FUELS
RF: Gelled-Propellants
Gels
Liquid-Propellants
Propellants

Gelled-Propellants
S: Gelled-Fuels

GELS
SA: Gelled-Fuels
Silica-Gels

GENERATORS
SA: Aerosol-Generators
Auxiliary-Power
Fluidic-Generator
Gas-Generator
Thermoelectric-Gen
RF: Power-Generation
Power-Sources

GERMANIUM

GIMBALS
RF: Gyroscopes

GLASS
SA: Fiberglass

GLASS-BEADS

GLASS-FABRIC
RF: Plastic-Laminates

GLASS-FIBERS
RF: Fiberglass
Fibers

GLASS-FILTERS
RF: Filters

GLAZING-MATERIALS
SA: Plastics
RF: Materials

Global-Surveillance
S: Surveillance

Glucinum
S: Beryllium

GLUCOSE
SA: Alpha-d-Glucose
Beta-d-Glucose
Penta-acetate
RF: Alpha-d-Glucose
Beta-d-Glucose
Penta-acetate

GLYCIDYL-NITRATE
RF: Nitrate

GLYCOLS
SA: Ethylene-Glycol

GLYOXAL
RF: Aldehydes

GOLD

GOSLING-MOTOR
RF: Motors

GR-S-RUBBER
RF: Rubber

GRAIN-CRACKING

GRAIN-DESIGN
RF: Design

GRAIN-SIZE

GRAINS
SA: Cruciform-Grains
Dual-Grain-Systems
Powder-Grains
Propellant-Grains
Reinforced-Grains
Sodium-Azide-Grain
Zuni-Grains

GRAPHITE
SA: Pyrolytic-Graphite
RF: Refractories

GRAPHITE-FUEL
RF: Fuels
Reactor-Fuel

GRAPHITE-MATERIALS
RF: Materials

GRAPHITE-STUDIES
RF: Studies

GRAVITY
SA: Low-G
Specific-Gravity
Zero-G

GRAVITY-CONTROL
SA: Zero-G-Control
RF: Control-Systems

Gravity-Environments
S: High-G-Environment
Low-G-Environment

GRAVITY-FED-ROCKET
RF: Feed-Systems
Rocket

GRAY-GAS
RF: Gases

Great-Altitudes
S: High-Altitude

GRID-TURBULENCE
RF: Turbulence

GROSS-WEIGHT
RF: Weight

GROUND-SHOCK
RF: Shock

GROUND-SUPPORT
SA: Aerospace-Gd-Equip
Semi-Trailer
Servicing-Equip
RF: Launch-Sites

Ground-Support-Equipment
S: GSE

GSE
RF: Ground-Support-Equipment

GUANIDINES
SA: Nitroguanidine
Perfluoroguanidine
RF: Amides

GUIDANCE
SA: Command-Guidance
Control-Systems
Flight-Control
Heat-Homing
Homing-Devices
Inertial-Guidance

Navigation
Rendezvous
Star-Trackers
Terminal-Guidance
RF: Navigation

GUIDANCE-SYSTEM

GUIDANCE-TECHNIQUE

GUIDED-MISSILES
SA: Polaris
Sidewinder
RF: Missile

GUINEA-PIGS
RF: Laboratory-Animals

GUN-FIRINGS
RF: Ballistics
Weapons-Research

GUN-PROPELLANTS
RF: Propellants

GUN-PROPULSION
RF: Propulsion

GUNS
SA: Compressed-Gas-Gun
High-Speed-Guns
Ignition-Energy
RF: Weapons

GYPSUM
SA: Alabaster

GYROSCOPES
SA: Gimbals
RF: Accelerometer
Flight-Instruments
Inertial-Guidance
Inertial-Navigation

HAFNIUM

HAFNIUM-ALLOYS
RF: Alloys

HALIDES
SA: Boron-Halide
Dihalides

HALOGEN-COMPOUNDS
RF: Compounds

HALOGENS

HANDLING-DEVICES
RF: Remote-Handling

HANDLING-PROBLEMS

HANDLING-TECHNIQUE

HASTELLOY-R-235
RF: Nickel-Base-Alloy

HAWK-MOTOR
RF: Motors

HAZARD-CLASS
SA: Sensitivity
RF: Hazard-Classification

Hazard-Classification
S: Hazard-Class

HAZARD-CONTROL
SA: Decontamination
Fume-Control
Leak-Prevention
RF: Launching-Hazards
Safety
Safety-Precautions

HAZARDS
SA: Accident-Hazards
Chemical-Hazards
Electric-Hazards
Explosion-Hazards
Fire-Hazards
Fuel-Hazards
Health-Hazards
Launching-Hazards
Potential-Hazards
Propellant-Hazards
Radiation-Hazards
Reactor-Hazards
Safety

HEALTH-HAZARDS
SA: Antidotes
Be-Hazard
Biological-Effects
Radiation-Hazards
Toxicity
RF: Chemical-Hazards
Fuel-Hazards
Hazards
Military-Chemicals
Propellant-Hazards
Toxicity

HEAT
SA: Specific-Heat

HEAT-CAPACITY

Heat-Conductivity
S: Thermal-Conduct

Heat-Content
S: Enthalpy

HEAT-EFFECTS

HEAT-EXCHANGERS

HEAT-FLUX
SA: High-Heat-Flux
RF: Flux

HEAT-GENERATION

HEAT-HOMING
RF: Guidance
Homing-Devices

HEAT-OF-COMBUSTION
RF: Combustion

HEAT-OF-EXPLOSION
RF: Explosion

HEAT-OF-FORMATION
RF: Formation

HEAT-OF-FUSION
RF: Fusion

HEAT-OF-REACTION
RF: Chemical-Reaction

HEAT-OF-SOLUTION
RF: Solutions
Chemical-Solutions

HEAT-PENETRATION

HEAT-RECOVERY
RF: Recovery

HEAT-SHIELD-MATLS
SA: Barrier-Materials
RF: Ablation-Materials
Shield-Materials

HEAT-SHIELDS
RF: Shield

HEAT-SOURCE
SA: Radioisotopes

HEAT-TRANSFER
SA: Boiling-Heat-Trans
Laminar-Heat-Trans
Marangoni-Effect
Radiant-Heat-Trans

HEAT-TRANSFER-ANAL
RF: Analysis
Heat-Transfer-Analysis

Heat-Transfer-Analysis
S: Heat-Transfer-Anal

HEAT-TREATMENT
RF: Metalworking

HEAT-UP-CYCLE

HEATED-CHAMBERS
RF: Chambers

HEATED-PLATES
RF: Plates

HEATED-TUBE
RF: Tube

HEATER-SYSTEMS
SA: Immersion-Heater

HEATING
SA: Aerodynamic-Heat
Base-Heating
Dielectric-Heating
Fission-Heating
Gamma-Ray-Heating
Induction-Heating
Nuclear-Heating
Preheating
Radiant-Heating
Rapid-Heating
Regenerative-Heat
Solar-Heating

HEATING-RATE

HEATING-TESTS
RF: Tests

HEAVY-GAS
RF: Gases

HEAVY-WATER
RF: Water

HEF
S: High-Energy-Fuel

HEF-2

HEF-3

HEF-4

HELICOPTERS
RF: Airplanes

HELIUM
SA: Joule-Thomson-Proc
Liquid-Helium
RF: Gases

HELIUM-EXPLOSIONS
RF: Explosion

HELIUM-PROPERTIES

HELIUM-STORAGE
RF: Storage

HEMISPHERES
RF: Spheres

HEPTANE

HERCULES-FPC-MOTOR
RF: Motors

HERMES-MOTOR
RF: Motors

HI-CAT
RF: Atmosphere
High-Clear-Air-Turbulence
Turbulent-Air

HIGH-ACCELERATION
RF: Acceleration

HIGH-ALTITUDE
RF: Altitude
Great-Altitude

HIGH-BURNING-RATE
RF: Burning-Rate

HIGH-CHAMBER-PRESS
RF: Chamber-Pressures
High-Chamber-Pressures

High-Chamber-Pressures
S: High-Chamber-Press

High-Clear-Air-Turbulence
S: HI-CAT

HIGH-DENSITY
RF: Density

HIGH-ENERGY-COMP
RF: Compounds
High-Energy-Compounds

High-Energy-Compounds
S: High-Energy-Comp

HIGH-ENERGY-FUEL
RF: Fuels
HEF

HIGH-ENERGY-MATER
RF: High-Energy-Materials
Materials

High-Energy-Materials
S: High-Energy-Mater

HIGH-ENERGY-OXIDIZ
RF: High-Energy-Oxidizer
Oxidizers

High-Energy-Oxidizers
S: High-Energy-Oxidiz

HIGH-ENERGY-POLY
RF: High-Energy-Polymers
Polymers

High-Energy-Polymers
S: High-Energy-Poly

HIGH-ENERGY-PROPEL
RF: High-Energy-Propellants
Propellants

High-Energy-Propellant-Hazards
S: Propellant-Hazards

High-Energy-Propellants
S: High-Energy-Propel

HIGH-EXPLOSIVES
RF: Explosives

HIGH-G-ENVIRONMENT
RF: Environment
Gravity-Environments

HIGH-HEAT-FLUX
RF: Heat-Flux

HIGH-IMPULSE
RF: Impulse

High-Impulse-Propellant-Systems
S: Impulse-Propel-Sys

HIGH-MACH-NUMBER
RF: Hypersonic-Flight
Mach-Numbers
Supersonic-Flight

HIGH-MASS-RATIO

HIGH-MODULUS-FIBER
RF: Fibers

HIGH-POWER
RF: Power

HIGH-PRESSURE
RF: Pressure
Superatmospheric-Pressure

HIGH-PRESSURE-CHEM
RF; Chemistry
High-Pressure-Chemistry

High-Pressure-Chemistry
S: High-Pressure-Chem

HIGH-PURITY-METALS
RF: Metals

HIGH-RESOLUTION
RF; Resolution

HIGH-SPEED
RF: Speed

High-Speed-Aircraft
S: Hypersonic-Vehicle
SST

HIGH-SPEED-CAMERA
RF: Cameras

HIGH-SPEED-FLIGHT
SA: Hypersonic-Flight
Supersonic-Flight
RF: Flight

HIGH-SPEED-GUNS
RF: Guns

HIGH-STRAIN-RATE
RF: Strain-Rate

HIGH-STRENGTH
RF: Strength

HIGH-TEMP-MATERIALS
SA: Beryllium
RF: High-Temperature-Materials
Materials

HIGH-TEMPERATURE
RF: Temperature

High-Temperature-Materials
S: High-Temp-Materials

HIGH-THRUST
RF: Thrust

HIGH-VELOCITY
RF: Velocity

HIGH STRENGTH-ALLOY
RF: Alloys
Superalloys

HOLLOW-CYLINDERS
RF: Cylinders

HOMING-DEVICES
SA: Heat-Homing
RF: Guidance

HONEST-JOHN
RF: JATO

HONEYCOMB-PANELS
RF: Panels

HONEYCOMB-STRUCT
RF: Honeycomb-Structures
Structures

Honeycomb-Structures
S: Honeycomb-Struct

HOT-AIR-IGNITION
RF: Ignition

HOT-FORMING
RF: Forming

HOT-GAS-BLOW-DOWN
RF; Gases

HOT-GAS-IGNITION
RF: Gases
Ignition

HAT-GAS-INJECTION
RF: Control-Techniques
Gaseous-Injection

HOT-GAS-PRIMER
RF: Gases
Primers

HOT-G'S-SYSTEMS
RF: Flight-Control

HOT-STORAGE
RF: Storage

HOT-WIRE-IGNITION
SA: Metal-Wire-Ignit
RF: Ignition

HUMAN-FACTORS
SA: Design-Consid
Physiology
System-Consid
RF: Bioastronautics

HUMIDITY
RF: Atmosphere

HYBALINE-A5-FUEL
RF: Fuels

HYBRID-COMBUSTION
RF: Combustion

HYBRID-ENGINE
RF: Engine

HYBRID-MOTOR
RF: Motors

HYBRID-PROPELLANT
RF: Propellants

HYBRID-PROPULSION
RF: Propulsion

HYBRID-ROCKET
RF: Rocket

HYBRID-SYSTEMS

HYDRAULIC-FLUIDS
RF: Fluids

HYDRAULIC-SYSTEMS
SA: Pneumatic-Systems
RF: Pneumatic-Systems

HYDRAZINE
SA: Boiling-Hydrazine
Dimethyl-Hydrazine
RF: Acetalazine

HYDRAZINE-COMPOUND
RF: Compounds

HYDRAZINE-FUEL
RF: Fuels

HYDRAZINE-HAZARD
RF: Liquid-Hazards

HYDRAZINE-VAPOR
RF: Vapor

HYDRAZOIC-ACID
SA: Azides
RF: Acids

HYDRAZONE
RF: Acetalazine

HYDRIDES
SA: Al-Hydride
Ca-Hydride
Li-Hydride
Metal-Hydrides

HYDROCARBON-COMBUS
RF: Combustion
Hydrocargon-Combustion

Hydrocarbon-Combustion
S: Hydrocarbon-Combus

HYDROCARBON-CRACK
RF: Hydrocarbon-Cracking

Hydrocarbon-Cracking
S: Hydrocarbon-Crack

HYDROCARBON-FUELS
RF: Fuels

HYDROCARBON-IGNIT
RF: Hydrocarbon-Ignition
Ignition

Hydrocarbon-Ignition
S: Hydrocarbon-Ignit

HYDROCARBONS
SA: Alkanes
Aromatic-Hydrocarb
Toluene
RF: Petroleum-Hydrocarbons

HYDROFLURIC-ACID
RF: Acids

HYDROGEN
SA: Atomic-Hydrogen
Gaseous-Hydrogen
Liquid-Hydrogen
RF: Gases

HYDROGEN-BONDING
RF: Bonding

HYDROGEN-BROMIDE
RF: Bromides

HYDROGEN-CHLORIDE
RF: Chloride

HYDROGEN-COMBUST
RF: Gas-Combustion
Hydrogen-Combustion

Hydrogen-Combustion
S: Hydrogen-Combust

Hydrogen-Diozide
S: Hydrogen-Peroxide
RF: Dioxides

HYDROGEN-EMBRITTLE
RF: Hydrogen-Embrittlement
Metal-Properties

Hydrogen-Embrittlement
S: Hydrogen-Embrittle

HYDROGEN-FIRES
RF: Fires

HYDROGEN-FLAMES
RF: Flames

HYDROGEN-FLUORIDE
RF: Fluoride

Hydrogen-Generation
S: Hydrogen-Product

HYDROGEN-HAZARD
RF: Gaseous-Hazard

HYDROGEN-ISOTOPE
SA: Deuterium
Tritium
RF: Isotopes

Hydrogen-Manufacture
S: Hydrogen-Product

HYDROGEN-MOLECULE
RF: Molecule

HYDROGEN-PEROXIDE
RF: Hydrogen-Dioxide
Liquid-Hazards
Liquid-Oxidizers

HYDROGEN-PRODUCT
RF: Hydrogen-Generation
Hydrogen-Manufacture
Hydrogen-Production

Hydrogen-Production
S: Hydrogen-Product

HYDROGEN-PROPERT
RF: Hydrogen-Properties

Hydrogen-Properties
S: Hydrogen-Propert

HYDROGEN-PROPULS
RF: Hydrogen-Propulsion
Propulsion

Hydrogen-Propulsion
S: Hydrogen-Propuls

HYDROGEN-REACTION
RF: Chemical-Reaction

HYDROGEN-SLUSH
RF: Slush-Hydrogen

HYDROGEN-SOLUBIL
RF: Hydrogen-Solubility

Hydrogen-Solubility
S: Hydrogen-Solubil

HYDROGENATION

HYDROGENOLYSIS

HYDROLYSIS

HYDROSTATIC-LOAD
RF: Loads

HYDROXIDES
SA: Barium-Hydroxide
Sodium-Hydroxide

HYDROXYLS

HYPER-ENVIRONMENT
RF: Environment

HYPERGOLIC-IGNIT
RF: Hypergolic-Ignition
Ignition

Hypergolic-Ignition
S: Hypergolic-Ignit

Hypersonic-Aircraft
    S: Hypersonic-Vehicle

HYPERSONIC-FLIGHT
    RF: Flight
        High-Mach-Number
        High-Speed-Flight

HYPERSONIC-FLOW
    RF: Flow

HYPERSONIC-VEHICLE
    SA: Reentry-Vehicles
    RF: Aircraft
        High-Speed-Aircraft
        Hypersonic-Aircraft

HYPERVELOCITY
    RF: Velocity

HYSTERESIS-LOOP
    RF: Magnetic-Fields

ICBM
    SA: Minuteman
        Mobile-ICBM
        Snark
        Titan
    RF: Intercontinental-Ballistic-
          Missiles

ICBM-SYSTEMS

IDEAL-GAS-THEORY
    RF; Gases

IGNITER-ANALYSIS
    RF: Analysis

IGNITER-DESIGN
    RF: Design

IGNITER-MIXTURES
    RF: Mixture

IGNITER-SYSTEM

IGNITERS
    SA: Artillery-Primers
        Bayonet-Type-Igniter
        Booster-Igniter
        Chemical-Igniters
        Conductive-Film
        Detonating-Cord
        Lexcord-Igniter
        Mass-Flow-Igniters
        Pyrogen-Igniter
        Tube-Igniter
    RF: Detonators
        Primers

IGNITION
    SA: Ammonia-Ignition
        Arc-Ignition
        Cobalt-Ignition
        Hot-Air-Ignition
        Hot-Gas-Ignition
        Hot-Wire-Ignition
        Hydrocargon-Ignit
        Hypergolic-Ignit
        Metal-Wire-Ignit
        Propellant-Ignit
        Reignition
        Spark-Ignition
        Spontaneous-Ignit
        Spray-Ignition
        Thermal-Ignition

IGNITION-COATINGS
    RF: Coatings

IGNITION-DELAY

IGNITION-ENERGY
    RF: Energy
        Guns

IGNITION-LIMITS

IGNITION-REACTIONS
    RF: Reaction

IGNITION-SENSIT
    RF: Ignition-Sensitivity
        Sensitivity

Ignition-Sensitivity
S: Ignition-Sensit

IGNITION-STUDIES
RF: Studies

IGNITION-SYSTEMS
RF: Ammunition

IGNITION-TEMP
RF: Ignition-Temperature
Temperature

Ignition-Temperature
S: Ignition-Temp

IGNITION TESTS
SA: Arc-Image-Furnace
Propellant-Deterio
RF: Tests

ILLUMINATION
SA: Optical-Illuminat
Photometers

IMAGE-CONVERTER

IMMERSION-HEATER
RF: Heater-Systems

IMPACT-DATA

IMPACT-LIMITER
SA: Inflated-Sphere

IMPACT-RESISTANCE
RF: Resistance

IMPACT-SENSITIVITY
RF: Sensitivity

IMPACT-STRENGTH
SA: Al-Impact-Strength
RF: Strength

IMPACT-VELOCITY
RF: Velocity

IMPEDANCE
SA: Admittance
RF: Admittance
Resistance

IMPELLER-PUMPS
RF: Pumps

IMPINGED-JETS
RF: Jets

IMPINGEMENT
SA: Jet-Impingement

IMPULSE
SA: High-Impulse
Ultra-High-Impulse
Variable-Impulse

IMPULSE-CONTROL
RF: Controls

IMPULSE-MEASURE
RF: Impulse-Measurement
Measurement

Impulse-Measurement
S: Impulse-Measure

IMPULSE-PROPEL-SYS
RF: High-Impulse-Propellant-Systems
Impulse-Propellant-Systems
Propellant-Systems
Ultra-High-Impulse-Propellant-Systems

Impulse-Propellant-Systems
S: Impulse-Propel-Sys

IMPULSE-ROCKET
RF: Rocket

INCONEL
RF: Nickel-Base-Alloy

INDEXES
SA: Abstracts
Bibliography
Documentation

RF: Abstracts
Bibliography
Document-Retrieval
Literature-Search
Publications

INDICATORS
SA: Accelerometer
RF: Instruments

INDUCTION-HEATING
RF: Furnaces
Heating

INERT-WEIGHT
RF: Weight

INERTIA
SA: Moments-of-Inertia

INERTIA-WHEEL
RF: Wheels

INERTIAL-GUIDANCE
SA: Gyroscopes
RF: Guidance

INERTIAL-NAVIGATION
SA: Flight-Instruments
Gyroscopes
RF: Accelerometer
Navigation
Navigation-Inertial

INFLATED-SPHERE
RF: Impact-Limiter
Spheres

Information-Retrieval
S: Document-Retrieval

INFORMATION-SOURCE

INFRARED-ANALYSIS
RF: Analysis

INFRARED-CELL
RF: Cells

INFRARED-DETECTION
RF: Detection

INFRARED-RADIATION
RF: Radiation

INFRARED-SPECTRA
RF: Spectra

INFRARED-SPECTORS
RF: Infrared-Spectroscopy
Spectroscopy

Infrared-Spectroscopy
S: Infrared-Spectors

INFRARED-STUDIES
RF: Studies

Inhibited-Red-Fuming-Nitric-Acid
S: IRFNA

Inhibited-White-Fuming-Nitric-Acid
S: IWFNA

INHIBITOR-MATERIAL
SA: Cellulose-Acetate
Ethyl-Cellulose

INJECTION
SA: Coaxial-Injection
Fluid-Injection
Fuel-Injection
Gaseous-Injection
Regenerative-Injec
Vortex-Injection

INJECTION-TECH
RF: Injection-Techniques

Injection-Techniques
S: Injection-Tech

INJECTOR-CONCEPTS

INJECTOR-DESIGN
RF: Design

INJECTOR-ORIFICE
RF: Orifices

INJECTOR-RESEARCH
RF: Research

INJECTOR-TESTS
RF: Tests

INJECTOR-THROTTLE
RF: Throttling

INJECTOR-THRUST
RF: Thrust

INJECTORS
SA: Jet-Injector
Rotating-Injector
Spray-Injector

INORGANIC-CHEM
RF: Chemistry
Inorganic-Chemistry

Inorganic-Chemistry
S: Inorganic-Chem

INORGANIC-CONTAM
RF: Contaminants
Inorganic-Contaminants

Inorganic-Contaminants
S: Inorganic-Contam

INSPECTION
SA: Flaw-Detection
Welding-Inspection

INSTABILITY
SA: Combustion-Instab
Explosive-Instabil
RF: Stability

INSTABILITY-ANAL
RF: Analysis
Instability-Analysis

Instability-Analysis
S: Instability-Anal

INSTRUMENTATION
RF: Instruments

INSTRUMENTS
SA: Accelerometer
Analyzers
Calorimeter
Flight-Instruments
Flowmeters
Gages
Indicators
Instrumentation
Mass-Spectrometer
Measurement
Photometers
Spectrometer
Spectrophotometers
Tensiometers
Voltmeters

INSULATED-CONES
RF: Cones

INSULATED-TANKS
RF: Tanks

INSULATION
SA: Asbestos
Cellulose-Acetate
Fibrous-Insulation
Motor-Insulation
Thermal-Protection
RF: Coatings
Rocket-Chamber

INSULATION-PANELS
RF: Panels

INTEGRAL-MANDRELS
RF: Mandrels

INTERACTION
SA: Reaction
RF: Reaction

INTERCEPT-SYSTEM
RF: Surveillance

INTERCEPT-X
RF: Ballistic-Missile

INTERCEPTION
RF: Space-Maneuvering

INTERCEPTORS
RF: Countermeasures

Intercontinental-Ballistic-Missiles
S: ICBM

INTERIOR-BALLISTIC
RF: Ballistics
Internal-Ballistics

Intermediate-Range-Ballistic-Missile
S: IRBM

INTERMETALLIC-COMP
RF: Compounds
Intermetallic-Compounds

Intermetallic-Compounds
S: Intermetallic-Comp.

INTERMETALLICS
RF: Metals

INTERMITTENT-CREEP
RF: Creep

Internal-Ballistics
S: Interior-Ballistic

INTERNAL-EXPANSION
RF: Expansion

INTERNAL-FRICTION
RF: Friction

INTERPLANETARY

INVAR
RF: Alloys
Iron-Nickel-Alloy

INVAR-WRAPPER
RF: Phoebus-Reactor

IODINE

ION-CHEMISTRY
RF: Chemistry

ION-EXCHANGE

ION-PROPULSION
RF: Propulsion

ION-SOURCE
RF: Source

IONIZATION

IONIZATION-EFFECTS

IONIZATION-SOURCES
RF: Source

IONIZATION-SUPPRES
RF: Ionization-Suppression

Ionization-Suppression
S: Ionization-Suppres

IONIZERS
SA: Porous-Inoizers

IONIZING-RADIATION
RF: Radiation

IONOSPHERE
RF: Atmosphere
Upper-Atmosphere

IONS
SA: Ferric-Ions
Rare-Earth-Ions

IRBM
SA: Polaris
Thor
RF: Intermediate-Range-Ballistic-Missile

IRFNA
SA: Acid subheadings
IWFNA
Nitric-Acid

RFNA
WFNA
RF: Acids
Anhydrous-Nitric-Acid
Inhibited-Red-Fuming-Nitric-Acid
Liquid-Oxidizers

IRFNA-CORROSION
RF: Corrosion

IRFNA-Hazard
S: Nitric-Acid-Hazard

IRIDIUM

IRIDIUM-ALLOYS
RF: Alloys

IRIDIUM-COATINGS
RF: Coatings

IRIS
RF: Sounding-Rockets

IRON
SA: Porous-Iron

IRON-CARBIDE
RF: Carbides

IRON-CATALYST
RF: Catalysts

IRON-NICKEL-ALLOY
SA: Invar
RF: Alloys

IRON-WHISKERS
RF: Whiskers

ISOCYANATE

ISOLDE-120-A
RF: Monopropellants

ISOMERS

Isopropanol
S: Isopropyl-Alcohol

ISOPROPYL-ALCOHOL
RF: Alcohol
Dimethyl-Carbinol
Isopropanol

ISOPROPYL-CHLORIDE
RF: Chlorides

ISOTOPES
SA: Hydrogen-Isotope

IWFNA
SA: Acid subheadings
IRFNA
Nitric-Acid
RFNA
WFNA
RF: Acids
Anyhdrous-Nitric-Acid
Inhibited-White-Fuming-Nitric-Acid
Liquid-Oxidizers

IWFNA-Hazard
S: Nitric-Acid-Hazard

JATO
SA: Honest-John
Matador
Nike-Missile
Power-Plants
Smokeless-JATO
RF: Aircraft-Engines
Jet-Assisted-Takeoff
Thrust-Augment

Jet-Assisted-Takeoff
S: JATO

JET-CONTROL-VANES
RF: Control-Systems

JET-DEFLECTION
RF: Deflection

JET-DRIVEN-FLOWS
RF: Flow

JET-DRIVEN-VORTEX
RF: Vortex

JET-ENGINE
SA: Turbojet-Engine
RF: Engine

JET-EXPANSION
RF: Expansion

JET-FUEL
RF: Fuels

JET-IMPINGEMENT
RF: Impingement

JET-INJECTOR
RF: Injectors

JET-MIXING
SA: Coaxial-Jet-Mixing

JET-MOTORS
RF: Motors

JET-PIPE

JET-PROPULSION
RF: Propulsion

JET-PROPULSION-SYS
RF: Jet-Propulsion-Systems
Propulsion-Systems

Jet-Propulsion-Systems
S: Jet-Propulsion-Sys

JET-PUMP
RF: Pumps

JET-REACTOR
RF: Reactors

JETS
SA: Exhaust-Jets
Free-Jets
Impinged-Jets

JOINING
SA: Al-Joining
Be-Joining
Bonding
Brazing
Nickel-Joining
Welding

JOINING-TECHNIQUES

JOINTS
SA: As-Welded-Joints
Lockseal
Riveted-Joints
Structural-Joints
Welded-Tank-Joints

JOULE-THOMSON-EFF
RF: Gaseous-Hydrogen
Joule0Thomson-Effect

Joule-Thomson-Effect
S: Joule-Thomson-Eff

JOULE-THOMSON-PROC
RF: Helium
Joule-Thomson-Process

Joule-Thomson-Process
S: Joule-Thomson-Proc

JP-4 FUEL
RF: Fuels
Kerosene-Type-Fuel

JP-5-FUEL
RF: Fuels
Kerosene-Type-Fuel

JPL-X500
RF: Ammonium-Perchlor
Propellants

JPX-FUEL
RF: Fuels

JUNO
RF: Space-Probes

Kel-F-Bladder-Cell
S: Bladder-Cell

KEL-F-LINERS
RF: Liners

KEROSENE
RF: Distillates

KEROSENE-TYPE-FUEL
SA: JP-4-Fuel
JP-5-Fuel
RF: Fuels

Kerr-Cell
RF: Cells

Ketone-Propane
S: Acetone

KETONES
SA: Acetone
Acetylacetone
Aldehydes
Carbonyl-Compounds
Diacetyl

KINETIC-CONSID
RF: Considerations
Kinetic-Considerations

Kinetic-Considerations
S: Kinetic-Consid

KINETIC-METHOD

KINETIC-STUDIES
RF: Studies

KINETIC-THEORY

KINETICS
SA: Chemical-Kinetics
Combustion-Kinetic
Condensation-Kinet
Conversion-Kinetic
Gas-Kinetics
Reaction-Kinetics

KIWI-REACTOR
RF: Reactors
Rover-Reactor

KNUDSEN-GAS
RF: Gases

LABORATORIES
SA: Research-Facility
Space-Laboratories
Test-Facility
RF: Research-Facility
Test-Facility

LABORATORY-ANIMALS
SA: Guinea-Pigs

LAMINAC-RESIN
RF: Resins

LAMINAR-FLAMES
RF: Flames

LAMINAR-FLOW
RF: Flow

LAMINAR-HEAT-TRANS
RF: Heat-Transfer
Laminar-Heat-Transfer

Laminar-Heat-Transfer
S: Laminar-Heat-Trans

LAMINAR-MIXING

LAMINATES
SA: Plastic-Laminates
Reinforced-Laminat
Structural-Laminat

LANDING
SA: Lunar-Landing
Mars-Landing

LANDING-IMPACT
RF: Abort

LANDING-MISSION
RF: Missions

LASER-BEAM

LASER-BEAM-WELDING
RF: Welding

LASER-DEVICES

LASERS
SA: Ring-Laser
Ruby-Laser
RF: Optical-Maser

LAUNCH-CONTROL
RF: Control-Systems

LAUNCH-MODES

LAUNCH-RATE

LAUNCH-SITES
SA: Ground-Support
Silos

LAUNCH-SYSTEMS

LAUNCH-VEHICLES
SA: Payload
Vanguard
RF: Aerospace-Vehicles
Vehicles

LAUNCHERS

LAUNCHING
SA: Orbital-Launch

LAUNCHING-HAZARDS
SA: Accidental-Firing
Explosion-Hazards
Fire-Hazards
Hazard-Control
Leak-Detection
Missile-Safety
Radiation-Hazards
Vapor-Detection
WS-Hazards
RF: Hazards

LAUNCHING-PROBLEMS

LAUNCHING-SHOCK
RF: Shock

LEAD

LEAD-COMPOUNDS
RF: Compounds

LEAD-SALTS
RF: Salts

LEAD-STANNATE
RF: Stannates

LEAK-DETECTION
RF: Detection
Fume-Control
Launching-Hazards
Safety-Precautions

LEAK-PREVENTION
RF: Hazard-Control
Leakage

LEAKAGE
SA: Connectors
Gaskets
Leak-Prevention
Seals

LEAPFROG
RF: Spike-Nozzle-Motor

LEM
RF: Apollo
Command-Module
Lunar-Excursion-Module

LEWIS-ACID
SA: Acid subheadings
Catalysts
RF: Acids

Lexcord-Igniter
S: Igniters

LI-BOROHYDRIDE
RF: Borohydrides

LI-CHLORIDE
RF: Chlorides

LI-FLUORIDE
RF: Fluoride

LI-HYDRIDE
RF: Hydrides

LI-HYDROGENATION

LI-HYDROXIDE

LI-PERCHLORATE
RF: Perchlorates
Solid-Oxidizers

LIGHT-METAL-COMBUS
RF: Combustion
Light-Metal-Combustion

Light-Metal-Combustion
S: Light-Metal-Combus

LIGHT-METAL-FUELS
SA: Cesium
RF: Fuels
Metallic-Fuel

LIGHT-METAL-RES
RF: Light-Metal-Research
Research

Light-Metal-Research
S: Light-Metal-Res

LIGHT-METALS
SA: Aluminum
Beryllium
Boron
Calcium
Cesium
Lithium
Magnesium
Potassium
Rubidium
Scandium
Silicon
Sodium
Strontium
RF: Aerospace-Metals
Metals

LIGHT-WEIGHT
RF: Weight

LIGHT-WEIGHT-TANKS
RF: Tanks

LIMITED-WARFARE
SA: Tactical-Systems
RF: Warfare

LINEAR-ACCELERAT
RF. Acceleration
Linear-Acceleration

Linear-Acceleration
S: Linear-Accelerat

LINEAR-PYROLYSIS
RF: Pyrolysis

LINEAR-SYSTEMS

LINEAR-TECHNIQUES

LINERS
SA: Acoustic-Liners
Ceramic-Liners
Kel-F-Liners
Metal-Liners
Nozzle-Liners
Refractory-Liners
Rocket-Liners
Tank-Liners

LIQUID-AMMONIA
RF: Ammonia
Liquid-Hazards

Liquid-Droplet
S: Droplets

LIQUID-EXPLOSIVES
RF: Explosives

LIQUID-FLUORINE
RF: Fluorine
Liquid-Oxidizers

LIQUID-FUELS
SA: Liquid-Rocket-Fuel
RF: Fuels

LIQUID-HAZARDS
SA: Acid-Hazards
Cryogenic-Liquids
Hydrazine-Hazard
Hydrogen-Peroxide
Liquid-Ammonia
Liquid-Oxidizers
Pentaborane-Hazard
RF: Chemical-Hazards

LIQUID-HELIUM
RF: Helium
Liquid-Oxidizers

LIQUID-HYDROGEN
RF: Cryogenic-Hydrogen
Hydrogen

LIQUID-LEVEL-GAGES
RF: Gages

LIQUID-METALS
RF: Metals

LIQUID-NITROGEN
RF: Liquid-Oxidizers
Nitrogen

LIQUID-OXIDIZERS
SA: Chlorine-Trifluor
Fluorine-Oxidizers
Hydrogen-Peroxide
IRFNA
IWFNA
Liquid-Fluorine
Liquid-Helium
Liquid-Nitrogen
Liquid-Oxygen
Liquid-Ozone
Nitric-Acid
Nitrogen-Tetroxide
RFNA
WFNA
RF: Liquid-Hazards
Liquid-Propellants
Oxidizer-Hazards

LIQUID-OXYGEN
SA: Lox
RF: Liquid-Oxidizers
Oxygen

LIQUID-OZONE
RF: Liquid-Oxidizers
Ozone

LIQUID-PHASE
SA: Condensation

Liquid-Propellant-Hazards
S: Propellant-Hazards

LIQUID-PROPELLANTS
SA: ARCOGEL
Cryogenic-Propel
Gelled-Fuels
Liquid-Oxidizers
RF: Propellants

LIQUID-PROPULSION
RF: Propulsion

LIQUID-ROCKET
RF: Rocket

LIQUID-ROCKET-FUEL
RF: Liquid-Fuels

LIQUID-SOLUTIONS
RF: Solutions

LIQUID-SPHERES
RF: Spheres

LIQUIDS
SA: Aeration
Fluids
Volatile-Liquids
RF: Fluids

LITERATURE
RF: Documentation

LITERATURE-SEARCH
SA: Indexes

LITHIUM
SA: Headings under Li.
RF: Alkali-Metals
Light-Metals

LITHIUM-COMPOUNDS
RF: Compounds

LITTLE-JOHN
RF: Artillery-Rockets
Surface-to-Surface

LOAD-CELLS
RF: Cells

LOAD-RELIEF-SYSTEM
RF: Acceleration-Loads
Relief-Systems
Shock

LOADING
SA: Edge-Loading
Explosive-Loaded
Pressure-Loading

LOADING-DENSITY
RF: Density

LOADING-RATE

LOADS
SA: Acceleration-Loads
Axial-Loads
Cyclic-Loads
Dynamic-Loads
Hydrostatic-Load

LOCKSEAL
RF: Joints
Seals

LOGISTICS
SA: Advanced-Bases
Lunar-Logistics

LOGISTICS-STUDIES
RF: Studies

LOKI-MISSILE
RF: Missile

LONG-RANGE-FLIGHT
RF: Flight

LONG-RANGE-ROCKET
RF: Rocket

LONGITUDINAL-FINS
RF: Fins

LONGITUDINAL-OSCIL
RF: Longitudinal-Oscillations
Oscillations

Longitudinal-Oscillations
S: Longitudinal-Oscil

LONGITUDINAL-STAB
RF: Longitudinal-Stability
Stability

Longitudinal-Stability
S: Longitudinal-Stab

LONGITUDINAL-VIBRA
RF: Longitudinal-Vibrations
Vibrations

Longitudinal-Vibrations
S: Longitudinal-Vibra

LOSS-RATE

LOSSES
SA: Acoustic-Losses
Fuel-Losses
Pressure-Losses

LOW-ALLOY-STEEL
RF: Alloys
Steels

LOW-ALTITUDE
RF: Altitude

LOW-COST
RF: Costs

LOW-COST-FILAMENTS
RF: Filaments

LOW-COST-MATERIALS
RF: Materials

LOW-COST-METHODS

LOW-COST-TOOLING
RF: Tooling-Costs

LOW-COWL-DRAG

LOW-DRAG
RF: Drag

LOW-FREEZING
RF: Freezing

LOW-FREEZING-POINT
RF: Freezing-Point

LOW-G
SA: Zero-G
RF: Gravity
Low-Gravity
Low-Pressure

LOW-G-ENVIRONMENT
RF: Environments
Gravity-Environments

LOW-G-PROBLEMS

Low-Gravity
S: Low-G

LOW-PRESSURE
SA: Low-G
RF: Pressure
Subatmospheric-Pressure
Vacuum

LOW-PRESSURE-CHAM
RF: Chambers
Low-Pressure-Chamber

Low-Pressure-Chamber
S: Low-Pressure-Cham

LOW-TEMP-EFFECT

LOW-TEMP-STUDIES
RF: Studies

LOW-TEMP-SYNTHESIS
RF: Synthesis

LOW-TEMPERATURE
SA: Cryogenic-Temp
RF: Cryogenic-Temp
Temperature

LOW-THRUST
RF: Thrust

LOW-VOLUME-RAMJET
RF: Ramjet

LOX
RF: Liquid-Oxygen
Oxidizers

LOX-LUBRICANT
RF: Lubricants

LOX-TANKS
SA: Saturn-LOX-Tank
RF: Tanks

LUBRICANTS
SA: Aircraft-Lubricants
Cutting-Fluids
Lox-Lubricant

LUBRICATION

LUMINESCENCE
SA: Thermoluminescence

LUNAR-BASES
RF: Bases

Lunar-Excursion-Module
S: LEM

LUNAR-LANDING
RF: Landing

LUNAR-LOGISTICS
RF: Logistics

LUNAR-MISSIONS
RF: Manned-Missions
Missions
Space-Missions

LUNAR-ORBITS
RF: Orbits

LUNAR-PROBES
SA: Ranger
Surveyor
RF: Probes

LUNAR-TRANSPORT
RF: Lunar-Transportation-Systems

Lunar-Transportation-Systems
S: Lunar-Transport

MACERATED-CORDITE
RF: Cordite

MACH-NUMBER-RANGE

MACH-NUMBERS
SA: High-Mach-Number

MACHINABLE-METAL
RF: Metals

MACHINING
SA: Alloy-Machining
Be-Machining
Mandrels
Spark-Erosion
Titanium-Machining
RF: Fabrication

MACHINING-PROCESS

MAGNESIA
RF: Refractories

MAGNESIUM
SA: Headings under Mg.
RF: Light-Metals

MAGNETIC-FIELDS
SA: Hysteresis-Loop
Magnetostriction

MAGNETIC-RESONANCE
RF: Resonance

MAGNETIC-TAPE
RF: Transcribers

MAGNETS
SA: Bar-Magnets

MAGNETOSTRICTION
RF: Magnetic-Fields

MAINTENANCE
SA: Space-Maintenance
Wear

MANAGEMENT
SA: Configuration-Mgt
Cost-Analysis
Planning
Safety-Management
Systems-Analysis

MANAGEMENT-REPORTS
RF: Publications

MANAGEMENT-SYSTEMS

MANDRELS
SA: Integral-Mandrels
RF: Machining

MANGANESE

MANGANESE-CARBIDE
RF: Carbides

MANIFOLD
RF: Engine
Fuel-Systems

MANIFOLD-EXPLOSION
RF: Explosion

MANNED-MISSIONS
SA: Lunar-Missions
Space-Missions
Space-Patrols
Unmanned-Missions
RF: Missions

Manned-Orbiting-Laboratory
S: MOL

Manned-Orbital-Research-Laboratory
S: MORL

MANNED-VEHICLES
RF: Aerospace-Vehicles
Spacecraft
Unmanned-Vehicles
Vehicles

MANUAL-CONTROL
RF: Controls

MANY-BODY-PROBLEM
SA: Perturbation
RF: Bodies

MAPPING
RF: Convolutional-Mapping

MARAGING-STEELS
RF: Steels

MARANGONI-EFFECT
RF: Heat-Transfer

MARINER
RF: Mars-Missions
Space-Probes

MARS

MARS-LANDING
RF: Landing

MARS-MISSIONS
SA: Mariner
RF: Missions

MARS-ORBIT
RF: Orbits

MASS-EXPULSION
RF: Attitude-Control
Expulsion

MASS-FLOW-IGNITERS
RF: Igniters

MASS-SPECTRA
RF: Spectra

MASS-SPECTROGRAPHY
RF: Spectrography

MASS-SPECTROMETER
RF: Instruments
Mass-Spectrometer

MASS-TRANSFER

MATADOR
RF: JATO

MATERIAL-SELECTION
SA: Optimum-Material

MATERIAL-TRANSFER
RF: Missile-Materials

MATERIALS
SA: Acetylene-Material
Ceramics
Chamber-Materials
Coating-Materials
Combustibles
Cryogenic-Material
Elestomers
Feed-Materials
Fuel-Materials
Glazing-Materials
Graphite-Materials
High-Energy-Mater
High-Temp-Materials
Low-Cost-Materials
Metals
Missile-Materials
Nuclear-Materials
Nylon
Plastics
Porous-Materials
Pyrolytic-Material
Reactor-Materials
Refractories
Sandwich-Materials
Space-Materials
Tank-Materials

MATTER
SA: Particulate-Matter

MAVERICK
RF: Tactical-Missiles

MEASUREMENT
SA: Force-Measurement
Impulse-Measure
Permeability-Meas
RF: Instruments

MEASURING-SYSTEM

MECHANICAL-DESIGN
RF: Design

MECHANICAL-FITTING
SA: Connectors
Seals
RF: Fittings

MECHANICS
SA: Flight-Mechanics
Fluid-Mechanics
Fracture-Mechanics
Orbital-Mechanics
Quantum-Mechanics
Rate-of-Onset

MEDIUM-STRENGTH
RF: Strength

MELTING

MELTING-POINT
SA: Eutectic-Melt

MELTING-TEMP
RF: Melting-Temperature
Temperature

Melting-Temperature
S: Melting-Temp

MEMBRANES
SA: Shell-Membranes

MERCAPTALS

MERCAPTANS

MERCURIC-CHLORIDE
RF: Chlorides

MERCURIC-FLUORIDE
RF: Fluoride

MERCURIC-OXIDE

MERCURIC-SALTS
RF: Salts

MERCURY

MERCURY-CELL
RF: Cells
Power-Sources

MESA-TYPE-PROPEL
RF: Mesa-Type-Propellant
Propellants

Mesa-Type-Propellant
S: Mesa-Type-Propel

META-BORIC-ACID
RF: Acids
Boric-Acid

METABORATE
SA: Sodium-Metaborate
RF: Borates

METAL-ADDITIVES
SA: Active-Metals
RF: Additives

METAL-BONDS
RF: Adhesives
Bonding

Metal-Borides
S: Borides

METAL-CARBIDES
SA: Acetylides
RF: Carbide-Coatings

METAL-COLUMNS
SA: Buckling
RF: Structures

METAL-CORROSION
SA: Specific metals
RF: Corrosion

METAL-DIAPHRAGM
RF: Diaphragms

METAL-DEFORMATION
RF: Deformation
Forging

METAL-HYDRIDES
SA: Be-Hydride
Sodium-Hydride
RF: Hydrides

METAL-LINERS
RF: Liners

METAL-PARTICLES
RF: Particles

METAL-POWDER
SA: Bi-Metallic-Powder
RF: Powder

METAL-PROPERTIES
SA: Fatigue-Properties
Fracture-Toughness
Hydrogen-Embrittle
Notch-Sensitivity

METAL-REMOVAL
RF: Metalworking
Milling

METAL-SULFIDES
RF: Sulfides

METAL-WIRE
RF: Bridgewire
Wire

METAL-WIRE-COMBUST
RF: Combustion
Exploding-Bridgewire
Exploding-Wire
Metal-Wire-Combustion

Metal-Wire-Combustion
S: Metal-Wire-Combust

METAL-WIRE-IGNIT
RF: Hot-Wire-Ignit
Ignition
Metal-Wire-Ignition

Metal-Wire-Ignition
S: Metal-Wire-Ignit

Metallic-Additives
S: Metal-Additives

METALLIC-ALUMINUM
RF: Aluminum

Metallic-Carbides
S: Acetylides

METALLIC-CONTAM
RF: Contaminants
Metallic-Contaminants

Metallic-Contaminants
S: Metallic-Contam

METALLIC-FUEL
SA: Light-Metal-Fuels
RF: Fuels

METALLIC-NOZZLES
RF: Nozzles

METALLIZED-PROPEL
RF: Metallized-Propellants
Propellants

Metallized-Propellants
S: Metallized-Propel

Metallo-Organic-Chemistry
S: Synthetic-Chem

METALLURGY
SA: Powder-Metallurgy

METALO-ACETYLENES
RF: Acetylene

METALS
SA: Active-Metals
Aerospace-Metals
Aircraft-Metals
Alloys
Bi-Metallics
Corrosion
Defense-Metals
High-Purity-Metals
Intermetallics
Light-Metals
Liquid-Metals
Machinable-Metal
Porous-Metal
Rare-Earth-Metals
Refractory-Metals
Sheet-Metals
Structural-Metals
Transition-Metals
Zinc
RF: Materials

METALWORKING
SA: Annealing
Casting
Chemical-Milling
Explosive-Forming
Heat-Treatment
Metal-Removal
RF: Forming

METEORITES

METEOROIDS

METEOROLOGY
SA: Air-Dispersion
Atmosphere
RF: Atmosphere

METHACRYLATE
RF: Plastics

METHANE
SA: Nitromethane

METHANE-AIR-FLAMES
RF: Flames

Methanol
S: Methyl-Alcohol

Methoxyethyl-Acrylate
S: Resin-Binders

METHYL-ALCOHOL
RF: Alcohol
Methanol

METHYL-BORATE
RF: Borates

Methyl-Carbinol
S: Ethyl-Alcohol

METHYL-CHLORIDE
RF: Chlorides

Methyl-Cyanide
S: Acetonitrile

METHYL-DISULFIDE

METHYL-ETHER
RF: Dimethyl-Ether
Ether

METHYL-IODIDE

METHYL-NITRATE
RF: Nitrate

METHYL-RADICALS
RF: Radicals

METHYLACETYLENE
RF: Acetylene

METHYLAMINE
RF: Amines

METHYLATION

METHYLENE

METHYLENE-CHLORIDE
RF: Chlorides

MG-BOROHYDRIDE
RF: Borohydrides

MG-DIBORIDE

MG-TETRABORIDE

MICROBIAL-CONTAM
RF: Contaminants
Microbial-Contaminants

Microbial-Contaminants
S: Microbial-Contam

MICROSECOND
RF: Accuracy

MICROTHRUST
RF: Thrust

MILITARY-CHEMICALS
SA: Chemical-Hazards
Health-Hazards
RF: Chemistry

MILLIMICROSECOND
RF: Accuracy

MILLING
SA: Chemical-Milling
Metal-Removal

MINUTEMAN
RF: ICBM
WS-133A

MINUTEMAN-DESIGN
RF: Design

MINUTEMAN-PROPEL
RF: Propellants

Minuteman-Propellants
S: Minuteman-Propel

MISSILE
SA: Able-1-Missile
Aim-X
Air-Launched
Air-to-Air
Air-to-Surface
ASW-Missile
Ballistic-Missile
Bullpup
Corporal-Missile
Guided-Missiles
Loki-Missile
Nike-Missile
Orbiting-Missile
Ramjet-Missile
Submarine-Missiles
Surface-to-Air
Surface-to-Surface
Tactical-Missiles
Zuni

MISSILE-AIRFRAME
RF: Airframe

MISSILE-BOOSTERS
RF: Boosters

MISSILE-COMPONENTS
SA: Nose-Cones
RF: Components

MISSILE-DEFENSE
SA: Active-Defense
Antimissiles
Countermeasures
Decoys
RF: Ballistic-Missile-Defense
Defense

MISSILE-ENVIRON
RF: Environment
Missile-Environ

Missile-Environment
S: Missile-Environ

MISSILE-FLIGHTS
RF: Flight

MISSILE-FUEL-TANKS
RF: Fuel-Tanks

MISSILE-MATERIALS
SA: Material-Transfer
RF: Materials

MISSILE-SAFETY
SA: Accidental-Firing
RF: Launching-Hazards
Safety

MISSILE-STORAGE
SA: Aging
RF: Storage

MISSILE-SYSTEMS
RF: Weapon-System

MISSILE-VIBRATION
RF: Vibrations

MISSION-ANALYSIS
RF: Analysis

MISSION-SENSIT
RF: Mission-Sensitivity
Sensitivity

Mission-Sensitivity
S: Mission-Sensit

MISSIONS
SA: Landing-Mission
Lunar-Missions
Manned-Missions
Mars-Missions
Test-Missions

MIXED-ACID
RF: Acids

MIXTURE
SA: Air-Mixtures
Gas-Mixtures
Igniter-Mixtures
Propellant-Mixture
RF: Admixture

MOBILE-ICBM
RF: ICBM

MOCKUP-STUDIES
RF: Studies

MOCK-UPS
SA: Models
RF: Models
Prototypes

MODEL-SCALEUP
RF: Production
Scaleup

MODEL-SCALING
RF: Scaling

MODELS
SA: Analytical-Models
Mock-Ups
Simulation
Wind-Tunnel-Models
RF: Mock-Ups
Prototypes

MODERATED-REACTOR
RF: Reactors

MODULAR-BOOSTERS
RF: **Boosters**
Phoenix-Modular-Booster

MODULAR-ROCKET
RF: Rocket

MODULE-TESTS
RF: Tests

MOL
RF: Manned-Orbiting-Laboratory

MOLECULAR-WEIGHT
RF: Weight

Molecular-Reaction
S: Adducts

MOLECULAR-STRUCT
RF: Molecular-Structures
Structures

Molecular-Structures
S: Molecular-Struct

MOLECULE
SA: Atom
Free-Molecule
Hydrogen-Molecule
Water-Molecule
RF: Atom

MOLLIER-CHARTS
RF: Gas-Dynamics

MOLYBDENUM
RF: Refractory-Metals

MOLYBDENUM-ALLOY
RF: Alloys

MOLYBDENUM-BORIDE
RF: Borides

MOMENTS-OF-INERTIA
RF: Damping
Inertia

MONEL
RF: Nickel-Base-Alloy

MONOFUEL-ROCKET
RF: Rocket

MONOFUELS
RF: Fuels

MONOMERS
SA: **Nitromonomers**
Polynitro-Monomers
Styrene-Monomer

MONOPROPELLANTS
SA: Isolde-120-A
RF: Propellants

MONTE-CARLO-METHOD
RF: Accuracy

MORL
RF: Manned-Orbital-Research-Laboratory
Orbital-Vehicles

MOTOR-CASES
SA: Rocket-Motor-Cases
RF: Cases

MOTOR-COOLING
RF: Cooling

MOTOR-DESIGN
RF: Design

MOTOR-FAILURE
RF: Failure

MOTOR-INSULATION
RF: Insulation

MOTOR-PERFORMANCE
RF: Performance

MOTOR-PLUME
RF: Plumes

MOTOR-RESPONSE

MOTORS
SA: Alcohol-Motor
Arrow-Type-Motor
Cuckoo-Motor
Dual-Thrust-Motor
End-Burning-Motor
Engine
Gosling-Motor
Hawk-Motor
Hercules-FPC-Motor
Hermes-Motor
Hybrid-Motor
Jet-Motors
Nike-Motor
Nike-Zeus-Motor
Nitromethane-Motor
Pulse-Motor
Reaction-Motor
Research-Motors
Restartable-Motor
Retro-Rocket-Motor
Rocket-Motor
Spike-Nozzle-Motor
Starter-Motor
Static-Test-Firing
Steering-Motor
Vernier-Motor
RF: Engine
Power-Sources

MOVING-BED-REACTOR
RF: Reactor

MULTISTAGE-REACTOR
RF: Reactors

N-F-COMPOUNDS
RF: Compounds

N-Butanol
S: Butyl-Alcohol

N-Butyl-Alcohol
S: Butyl-Alcohol

NAVIGATION
SA: Doppler-Navigation
Flight-Control
Flight-Instruments
Fluid-Navigation
Guidance
Inertial-Navigation
Space-Navigation
RF: Guidance

Navigation-Fluid
S: Fluid-Navigation

Navigation-Inertial
S: Inertial-Navigation

NERVA-ENGINE
RF: Nuclear-Engines
RIFT
Rover-Reactor

NEUTRONICS
RF: Reactors
Rover-Project

NICKEL
SA: Porous-Nickel

NICKEL-BASE-ALLOY
SA: Hastelloy-R-235
Inconel
Monel
Rene-41
Udimet-500
RF: Alloys

NICKEL-JOINING
RF: Joining

NICKEL-PROPERTIES

NICKEL-TRANSDUCERS
RF: Transducers

NIKE-MISSILE
RF: JATO
Missile

NIKE-MOTOR
RF: Motors

NIKE-PROPELLANT
RF: Propellants

NIKE-ZEUS-MOTOR
RF: Motors

Niobium
S: Columbium

NITRATE
SA: Ammonium-Nitrate
Barium-Nitrate
Ethyl-Nitrate
Glycidyl-Nitrate
Methyl-Nitrate
Propyl-Nitrate
Sodium-Nitrate
Tetranitrate

NITRATE-ESTERS
RF: Esters

NITRATE-SALTS
RF: Salts

NITRATION

NITRIC-ACID
SA: FNA
IRFNA
IWFNA
RFNA
WFNA
RF: Acids
Anhydrous-Nitric-Acid
Liquid-Oxidizers

NITRIC-ACID-HAZARD
RF: Acid-Hazards

NITRIC-OXIDE

NITRILES

NITRITES
SA: Silver-Nitrate

NITROCELLULOSE
SA: Sulfate-Wood-Pulps
RF: Binders
Cellulose
Cellulose-Nitrate

NITROGEN
SA: Liquid-Nitrogen
RF: Gases

NITROGEN-BOILOFF

NITROGEN-COMPOUNDS
RF: Compounds

NITROGEN-DIOXIDE
RF: Dioxides

NITROGEN-FIXATION

NITROGEN-FLUORIDE
RF: Fluoride

NITROGEN-OXIDES

NITROGEN-RICH-BIND
RF: Binders
Nitrogen-Rich-Binders

Nitrogen-Rich-Binders
S: Nitrogen-Rich-Bind

NITROGEN-TANKS
RF: Tanks

NITROGEN-TETROXIDE
RF: Liquid-Oxidizers

NITROGLYCERIN

NITROGUANIDINE
RF: Guanidines

NITROLYSIS

NITROMETHANE
RF: Methane

NITROMETHANE-MOTOR
RF: Motors

NITROMONOMERS
RF: Monomers

NITRONIUM

NITROPARAFFINS
RF: Paraffins

NITROPOLYMERS
RF: Polymers

NITROPROPANE
RF: Propane

NITROSTARCH

NITROUS-OXIDE

NOBLE-GAS
RF: Gases

NONCAVITATING-COND
RF: Cavitation
Noncavitating-Conditions

Noncavitating-Conditions
S: Noncavitating-Cond

NONFERROUS-ALLOYS
RF: Alloys
Superalloys

NONVOLATILE-BORANE
RF: Borane

NOSE-CONES
RF: Missile-Components

NOTCH-SENSITIVITY
RF: Fatigue
Metal-Properties
Sensitivity

NOVA-PROPULSION
RF: Propulsion

NOZZLE-CONCEPTS

NOZZLE-CONTOURS

NOZZLE-COOLANTS
RF: Coolants

NOZZLE-DESIGN
SA: Prandtl-Meyer-Func
Thrust-Coefficient
RF: Design

NOZZLE-DEVELOPMENT

NOZZLE-EJECTOR
RF: Ejectors

NOZZLE-EROSION
RF: Erosion

NOZZLE-EXTENSIONS

NOZZLE-LINERS
RF: Liners

NOZZLE-MATERIALS
RF: Ablation-Materials

NOZZLE-SYSTEMS

NOZZLE-THEORY

NOZZLE-THROATS
RF: Throats

NOZZLES
SA: Annular-Nozzles
Carbide-Nozzles
Conical-Nozzles
Exhaust-Nozzles
Exit-Nozzles
Film-Cooled-Nozzle
Metallic-Nozzles
Plug-Nozzles
Porous-Nozzle
Quench-Nozzles
Rocket-Nozzles
Supersonic-Nozzle
Transparent-Nozzle
RF: Convergent-Divergent-Nozzles

NUCLEAR-COMBUSTION
RF: Combustion

NUCLEAR-ENGINES
SA: Aspen
Carbide-Core
Nerva-Engine
Reactor-Engine-Sys
Reactor-Fuels
RF: Engine

NUCLEAR-EXPLOSION
RF: Explosion

NUCLEAR-FUELS
SA: Deuterium-Fuel
RF: Fuels

NUCLEAR-HEATING
RF: Heating

NUCLEAR-MATERIALS
RF: Materials

NUCLEAR-PHYSICS
RF: Physics

NUCLEAR-POWER
SA: SNAP
RF: Power

NUCLEAR-PROPULSION
SA: Fission-Power
Orion
RF: Thermonuclear-Propulsion

NUCLEAR-RADIATION
SA: Argus-Effect
RF: Radiation

NUCLEAR-REACTION
SA: Spallation
RF: Reaction

NUCLEAR-ROCKET
RF: Rocket

NUCLEAR-SAFETY
SA: Rover-Project
RF: Safety

NUCLEAR-SYSTEMS

NUCLEAR-TESTS
RF: Tests

NUCLEAR-VEHICLES
SA: Rover
RF: Vehicles

NUCLEAR-WEAPONS
RF: Weapons

NUCLEATION

NUMERICAL-SOLUTION
RF: Computation
Solutions

NYLON
RF: Amides
Fibers
Materials

O-RINGS
RF: Seals

OLANES

OLEFINS

OPACITIES
SA: Spectral-Opacities

OPERATING-CHARACT
RF: Operating-Characteristics

Operating-Characteristics
S: Operating-Charact

OPTICAL-ABSORBANCE
RF: Absorptance

OPTICAL-CHARACTER
SA: Resolution
RF: Optical-Characteristics

Optical-Characteristics
S: Optical-Character

OPTICAL-ILLUMINAT
RF: Illumination
Optical-Illumination

Optical-Illumination
S: Optical-Illuminat

Optical-Maser
S: Lasers

OPTICAL-METHODS

OPTICAL-PROPERTIES

OPTICAL-STUDIES
RF: Studies

OPTIMIZATION
SA: Pulse-Optimization

OPTIMUM-BURNING
RF: Burning

OPTIMUM-DESIGN
RF: Design

OPTIMUM-LENGTH

OPTIMUM-MATERIALS
RF: Material-Selection

OPTIMUM-THRUST
RF: Thrust

OPTIMUM-TRAJECT
RF: Optimum-Trajectories
Trajectories

Optimum-Trajectories
S: Optimum-Traject

ORBITAL-CARRIER
RF: Aerospace-Vehicles

ORBITAL-FLIGHT
RF: Flight

ORBITAL-LAUNCH
RF: Launching

ORBITAL-MECHANICS
SA: Docking
Many-Body-Problem
Perturbation
Rendezvous
Two-Body-Problem
RF: Mechanics
Space-Sciences

ORBITAL-TRANSPORT
RF: Transports

ORBITAL-TRANSFER

ORBITAL-VEHICLES
SA: MORL
Satellites
RF: Aerospace-Vehicles
Vehicles

ORBITING-MISSILE
RF: Missile

ORBITS
SA: Circular-Orbits
Earth-Orbits
Lunar-Orbits
Mars-Orbit
Planetary-Orbits
Satellite-Orbits

ORGANIC-CHEMISTRY
RF: Chemistry

ORGANIC-COATINGS
RF: Abrasion
Coatings
Erosion
Finishes

ORGANIC-COMPOUNDS
RF: Compounds

ORGANIC-SOLVENTS
RF: Solvents

ORGANOBORANE-FUEL
RF: Fuels

ORGANOBORANES
RF: Borane

ORIFICES
SA: Fuel-Orifice
Injector-Orifice

ORION
RF: Nuclear-Propulsion

ORTHO-BORIC-ACID
SA: Acid subheadings
RF: Acids
Boric-Acid

ORTHOTOLUIDINE
RF: Amines

OSCILLATIONS
SA: Fluid-Oscillations
Longitudinal-Oscil
Rotary-Screaming
Vibrations
RF: Vibrations

OSCILLATORY-FLOW
RF: Flow

Oxidants
S: Oxidizers

OXIDATION
SA: Explosive-Oxidat
Thermal-Oxidation

OXIDATION-PROTECT
RF: Coatings
Oxidation-Protection
Protection

Oxidation-Protection
S: Oxidation-Protect

OXIDATION-RESIST
RF: Oxidation-Resistance
Resistance

Oxidation-Resistance
S: Oxidation-Resist

OXIDIZER-BINDERS
SA: Acetonitrile
RF: Binders

OXIDIZER-CHEMISTRY
RF: Chemistry

OXIDIZER-ENCAPSUL
RF: Encapsulation
Oxidizer-Encapsulation

Oxidizer-Encapsulation
S: Oxidizer-Encapsul

OXIDIZER-HAZARDS
SA: Fluorine-Hazards
Liquid-Oxidizers
RF: Propellant-Hazards

OXIDIZER-STABILITY
RF: Stability

OXIDIZERS
SA: Energetic-Oxidizer
Flox
High-Energy-Oxidizers
Liquid-Oxidizers
Lox
Ozone
Rocket-Oxidizers
Solid-Oxidizers
RF: Oxidants

OXYGEN
SA: Boiling-Oxygen
Liquid-Oxygen
RF: Gases

OXYGEN-HAZARD
RF: Gaseous-Hazard

Oxyisobutyric-Nitrile
S: Acetone-Cyanhydrin

OZONE
SA: Liquid-Ozone
RF: Gases
Oxidizers

OZONE-HAZARD
RF: Gaseous-Hazards

OZONE-STABILITY
RF: Stability

OZONE-SYSTEMS

OZONIDES

P-V-T
RF: Pressure-Volume-Temperature

PAINTS
SA: Enamels
RF: Coatings

PALLADIUM

PANEL-FATIGUE
RF: Fatigue

PANELS
SA: Honeycomb-Panels
Insulation-Panels
Plastic-Panels
Sandwich-Panels
RF: Plates

PARAFFINS
SA: Nitroparaffins
RF: Petroleum-Products

PARAMETRIC-AMP
RF: Amplifiers
Parametric-Amplifiers

Parametric-Amplifiers
S: Parametric-Amp

PARAMETRIC-DATA

PARAMETRIC-DESIGN
RF: Design

PARAMETRIC-STUDIES
RF: Studies

PARTICLE-COUNTER

PARTICLE-LAG
RF: Velocity-Lag

PARTICLE-SIZE

PARTICLE-SYMMETRY

PARTICLES
SA: Metal-Particles

PARTICULATE-MATTER
RF: Matter

PAYLOAD
SA: Saturn-Payload
RF: Boosters
Launch-Vehicles

PAYLOAD-CAPABILITY

PAYLOAD-COST
RF: Costs

PAYLOAD-EVALUATION

PAYLOAD-WEIGHT
RF: Weight

PELLETS
RF: Propellant-Grains
Solid-Oxidizers
Solid-Propellants

PENDULUM-ANALOGY

PENETRATION

PENETRATION-AIDS
SA: WS-SR-199

PENTAACETATE
SA: Glucose
RF: Alpha-d-Glucose
Beta-d-Glucose
Glucose

PENTABORANE
RF: Dihydropentaborane
Pentaboron-Enneahydride

Pentaboron-Enneahydride
S: Pentaborane

PENTABORANE-HAZARD
RF: Liquid-Hazards

PHOTOCHEMISTRY
RF: Chemistry

PHOTOGRAPHY
SA: Cameras
Radiography

PHOTOLYSIS
SA: Ammonia-Photolysis

PHOTOMETERS
RF: Illumination
Instruments

PHOTOVOLTAIC-CELLS
RF: Cells
Energy-Conversion
Power-Sources

PHTHALATE-ESTER
RF: Esters

PHTHALATES
SA: Dibutyl-Phthalates

PHYSICAL-ANALYSIS
RF: Analysis

PHYSICAL-CHEMISTRY
RF: Chemistry

PHYSICAL-CONSTANTS

PHYSICAL-PHENOMENA

PHYSICS
SA: Nuclear-Physics
Plasma-Physics
Reactor-Physics

PHYSIOLOGY
RF: Human-Factors

PIEZO-GAGES
RF: Gages

PIEZOELECTRICITY
RF: Electrical-Phenom

PILOT-PLANT
RF: Production

PISTON-PUMP
RF: Pumps

PISTON-TUBE
RF: Tube

PISTONS
RF: Fuel-Tanks

PLANETARY-ORBITS
RF: Orbits

PLANNING
SA: Design-Selection
RF: Management

PLASMA-ARC

PLASMA-ARC-WELDING
RF: Welding

PLASMA-ENGINE
RF: Engine

PLASMA-PHYSICS
RF: Physics

PLASMA-PROBES
RF: Probes

PLASMA-PROPULSION
RF: Propulsion

PLASMAS
SA: Flame-Plasma
Quantum-Plasma

Plastic-Chars
S: Ablation-Chars

PLASTIC-FLOW
SA: Rheology
RF: Flow

PLASTIC-LAMINATES
SA: Glass-Fabric
RF: Laminates

PLASTIC-PANELS
RF: Panels

PLASTIC-PROPELLANT
  RF: Propellants

PLASTIC-TANKS
  RF: Tanks

PLASTICIZERS
  SA: Carbamite

PLASTICS
  SA: Methacrylate
    Reinforced-Plastic
    Structural-Plastic
    Thermoplastics
    Vinyl
  RF: Ablation-Materials
    Glazing-Materials
    Materials

PLASTISOL-EXPLOS
  RF: Explosives
    Plastisol-Explosives

PLASTISOL-PROPEL
  RF: Plastisol-Propellants
    Propellants
    Vinyl-Plastisol

Plastisol-Propellants
  S: Plastisol-Propel

PLATES
  SA: Flat-Plates
    Heated-Plates
    Panels
    Rectangular-Plates
    Steel-Plates
  RF: Structures

PLATINUM

PLIABLE-EXPLOSIVE
  RF: Explosives

PLUG-BURNER-TECH
  RF: Burner
    Plug-Burner-Technique

Plug-Burner-Technique
  S: Plug-Burner-Tech

PLUG-CLUSTER
  RF: Clusters

PLUG-NOZZLES
  RF: Nozzles

PLUMES
  SA: Exhaust-Plume
    Motor-Plume

PLUTONIUM
  RF: Reactor-Fuel

PNEUMATIC-SYSTEMS
  SA: Hydraulic-Systems
  RF: Hydraulic-Systmes

POLARIS
  RF: Guided-Missiles
    IRBM
    Submarine-Missiles
    Surface-to-Surface

POLARIS-PROPELLANT
  RF: Propellants

POLONIUM

POLYACRYLAMIDE
  RF: Acrylamide

POLYAMINES
  RF: Amines

POLYBUTADIENE
  RF: Butadiene

POLYESTER-RESIN
  RF: Resins

POLYETHYLENE
  RF: Ethylene

POLYISOBUTYLENE

POLYMER-ADHESIVES
  RF: Adhesives

POLYMERIZATION

POLYMERS
SA: Borane-Polymer
High-Energy-Poly
Nitropolymers
Vinyl-Polymers

POLYNITRO-MONOMERS
RF: Monomers

POLYPROPYLENE
RF: Propylene

POLYSTYRENE
RF: Styrene

POLYSULFIDE
RF: Sulfides

POLYURETHANE-ELAST
RF: Elastomers
Polyurethane-Elast

Polyurethane-Elestomers
S: Polyurethane-Elast

POLYURETHANE-RESIN
RF: Resin-Binders
Resins

POLYURETHANES
RF: Urethane

POLYVINYL-ACETATE

POLYVINYL-CHLORIDE
RF: Chlorides

POROSITY-TEST
RF: Tests

POROUS-CERAMICS
RF: Ceramics

POROUS-FLAT-PLATE
RF: Flat-Plates

POROUS-IONIZERS
RF: Ionizers

POROUS-IRON
RF: Iron

POROUS-MATERIALS
RF: Materials

POROUS-METAL
RF: Metals

POROUS-NICKEL
RF: Nickel

POROUS-NOZZLE
RF: Nozzles

POROUS-TUBE
RF: Tube

Positive-Expulsion-Techniques
S: Expulsion-Tech

POTASSIUM
RF: Alkali-Metals
Light-Metals

POTASSIUM-BROMIDE
RF: Bromides

POTASSIUM-CHLORATE

POTASSIUM-CHLORIDE
RF: Chlorides

POTASSIUM-COMPOUND
RF: Compounds

POTASSIUM-FLUORIDE
RF: Fluoride

POTASSIUM-NITRATE
RF: Solid-Oxidizers

POTASSIUM-PERCHLOR
RF: Perchlorates
Potassium-Perchlorate
Solid-Oxidizers

Potassium-Perchlorate
S: Potassium-Perchlor

POTASSIUM-SULFATE

POTENTIAL-FLOW
RF: Flow

POTENTIAL-HAZARDS
RF: Hazards

POWDER
SA: Al-Powder
Bi-Metallic-Powder
Black-Powder
Casting-Powder
Metal-Powder

POWDER-COMPACTS

POWDER-GAS-EROSION
RF: Erosion

POWDER-GASES
RF: Gases

POWDER-GRAINS
RF: Grains

POWDER-METALLURGY
RF: Metallurgy

POWER
SA: Fission-Power
High-Power
Nuclear-Power
Submarine-Power
Thermionic-Power

POWER-DENSITY
RF: Density

POWER-EQUIPMENT

POWER-GENERATION
SA: Generators

POWER-PLANTS
SA: Auxiliary-Power
Rocket-Power-Plant
RF: Aircraft-Engines
JATO

POWER-REQUIREMENTS

POWER-SOURCES
SA: Electrolytic-Cell
Energy-Sources
Engine
Fuel-Cells
Generators
Mercury-Cell
Motors
Photovoltaic-Cells
Radiant-Energy
Reactors
Solar-Energy
RF: Sources

POWER-SUPPLIES
RF: Auxiliary-Power

POWER-SYSTEMS
SA: Space-Power-System

POWER-TRANSMISSION

PRANDTL-MEYER-FUNC
RF: Functions
Nozzle-Design

Prandtl-Meyer-Functions
S: Prandtl-Meyer-Func

PRECOMBUSTION
RF: Combustion

PREHEATING
RF: Heating

PRESSURE
SA: Ambient-Pressure
Atmospheric-Pressure
Base-Pressure
Chamber-Pressure
Combustion-Press
Critical-Pressure
External-Pressure
Gas-Pressure
High-Pressure
Low-Pressure
Static-Pressure
Ultra-Low-Pressure
Vapor-Pressure
RF: Superatmospheric-Pressure

PRESSURE-CURVE

PRESSURE-DROP

PRESSURE-EFFECT

PRESSURE-FED
SA: Feed-Pumps
RF: Propellant-Feed

PRESSURE-GAGES
RF: Gages

PRESSURE-GRADIENTS

PRESSURE-LOADING
RF: Loading

PRESSURE-LOSSES
RF: Losses

PRESSURE-RANGE

PRESSURE-VARIATION

PRESSURE-VESSELS
RF: Tanks

Pressure-Volume-Temperature
S: P-V-T

PRESSURIZATION
SA: Gas-Pressurization

PRESSURIZATION-SYS
RF: Pressurization-System

Pressurization-System
S: Pressurization-Sys

PRESSURIZED-SHELLS
RF: Shells

PRIMARY-FLOW
RF: Flow

PRIMARY-VORTEX
RF: Vortex

PRIMERS
SA: Eimite
Electric-Primers
Hot-Gas-Primer
Igniters

PROBES
SA: Lunar-Probes
Plasma-Probes
Research-Probes
Space-Probes
Venus-Probes

PROCESS-SCALEUP
RF: Production
Scaleup

PROCESSING
SA: Chemical-Processing
Propellant-Process

PRODUCTION
SA: Model-Scaleup
Pilot-Plant
Process-Scaleup

PRODUCTION-COSTS
RF: Costs

PROGRAMMING
RF: Computer-Programs

PROJECTILES
SA: Drag

PROPADIENE
RF: Allene
Dimethylene-Methane

PROPANE
SA: Nitropropane

PROPANE-AIR-FLAMES
RF: Flames

Propanone
S: Acetone

PROPARGYL-ALCOHOL
RF: Alcohol

PROPARGYL-AMINE
RF: Amines

PROPARGYL-CHLORIDE
RF: Chlorides

Propellant-Actuated-Devices
S: Actuators

PROPELLANT-ADD
SA: Additives
Chemical-Additives
Metal-Additives
RF: Additives

Propellant-Additives
S: Propellant-Add

PROPELLANT-AGING
RF: Propellant-Deterio

PROPELLANT-ANAL
RF: Analysis
Propellant-Analysis

Propellant-Analysis
S: Propellant-Anal

PROPELLANT-BURNING
SA: Additive-Effects
Burning-Rate

PROPELLANT-CHARGES

PROPELLANT-CHEM
RF: Chemistry
Propellant-Chemistry

Propellant-Chemistry
S: Propellant-Chem

PROPELLANT-CURING
RF: Curing

PROPELLANT-DATA

PROPELLANT-DENSITY
RF: Density

PROPELLANT-DETERIO
SA: Propellant-Aging
Safe-Life
RF: Ignition-Tests
Propellant-Deterioration

Propellant-Deterioration
S: Propellant-Deterio

PROPELLANT-DEVELOP
RF: Propellant-Development

Propellant-Development
RF: Propellant-Develop

PROPELLANT-EXPULS
RF: Expulsion
Propellant-Expulsion

Propellant-Expulsion
S: Propellant-Expuls

PROPELLANT-FAILURE

PROPELLANT-FEED
SA: Pressure-Fed
Propellant-Supply
RF: Feed-Systems

PROPELLANT-FILLING

PROPELLANT-FLOW
RF: Flow

PROPELLANT-GAS
RF: Gases

PROPELLANT-GRAINS
SA: Pellets
RF: Grains
Solid-Propellants

PROPELLANT-HAZARDS
SA: Explosion-Hazards
Fire-Hazards
Fuel-Hazards
Health-Hazards
Oxidizer-Hazards
RF: Fuel-Hazards
Hazards
High-Energy-Propellant-Hazards

Liquid-Propellant-Hazards
Solid-Propellant-Hazards

PROPELLANT-IGNIT
RF: Ignition
Propellant-Ignition

Propellant-Ignition
S: Propellant-Ignit

PROPELLANT-MIXTURE
RF: Mixture

PROPELLANT-PARAM
RF: Propellant-Parameters

Propellant-Parameters
S: Propellant-Param

PROPELLANT-PERFORM
RF: Propellant-Performance

Propellant-Performance
S: Propellant-Perform

PROPELLANT-PROCESS
RF: Processing
Propellant-Processing

Propellant-Processing
S: Propellant-Process

PROPELLANT-RES
RF: Propellant-Research
Research

Propellant-Research
S: Propellant-Res

PROPELLANT-SENSIT
RF: Propellant-Sensitivity
Sensitivity

Propellant-Sensitivity
S: Propellant-Sensit

PROPELLANT-SPILLS
RF: Decontamination

PROPELLANT-STABIL
RF: Propellant-Stability

Propellant-Stability
S: Propellant-Stabil

PROPELLANT-STORAGE
RF: Storage

PROPELLANT-SUPPLY
RF: Propellant-Feed

PROPELLANT-SYSTEMS
SA: Impulse-Propel-Sys

PROPELLANT-TANKS
RF: Tanks

PROPELLANT-TECH
RF: Propellant-Technology

Propellant-Technology
S: Propellant-Tech

PROPELLANT-X-9

PROPELLANTS
SA: Acetylene-Propel
Aged-Propellants
Aircraft-Fuels
Alumizine-Propel
Ammonium-Nitrate
B-N-Propellants
Ball-Propellants
Bi-Propellants
Case-Bonded-Propel
Catapult-Propel
Colloidal-Propel
Composite-Propel
Corporal-Propel
Double-Base-Propel
Gelled-Fuels
Gun-Propellants
High-Energy-Propel
Hybrid-Propellant
JPL-X500
Liquid-Propellants
Mesa-Type-Propel
Metallized-Propel
Minuteman-Propel
Monopropellants
Nike-Propellant
Plastic-Propellant
Plastisol-Propel

Polaris-Propellant
Reactive-Propel
Rocket-Propellant
Rover-Fuel
Solid-Propellants
RF: Fuels

PROPOSALS
RF: Publications
Technical-Proposals

PROPULSION
SA: Aerospace-Propuls
Apollo-Propulsion
Booster-Propulsion
Electric-Propuls
Gun-Propulsion
Hybrid-Propulsion
Hydrogen-Propuls
Ion-Propulsion
Jet-Propulsion
Liquid-Propulsion
Nova-Propulsion
Plasma-Propulsion
Rocket-Propulsion
Satellite-Propuls
Solar-Propulsion
Space-Propulsion
Submarine-Propuls

PROPULSION-COSTS
RF: Costs

PROPULSION-RES
RF: Propulsion-Research
Research

Propulsion-Research
S: Propulsion-Res

PROPULSION-SYSTEMS
SA: Fuel-Injection
Jet-Propulsion-Sys

Propulsion-System-Bell-Model-8048
S: Bell-Model-8048

Propulsion-System-Bell-Model-8181
S: Bell-Model-8181

PROPYL-ALCOHOL
RF: Alcohol
Ethyl-Carbinol

PROPYL-NITRATE
RF: Nitrate

PROPYLAMINE
RF: Amines

PROPYLENE
SA: Polypropylene

PROTECTION
SA: Corrosion-Protect
Fire-Protection
Oxidation-Protect
Thermal-Protection

PROTECTIVE-COATING
RF: Acid-Resistant-Coatings
Coatings
Corrosion

PROTECTIVE-STRUCT
RF: Protective-Structures
Structures

Protective-Structures
S: Protective-Struct

PROTOTYPES
SA: Mock-Ups
Models

PUBLICATIONS
SA: Bibliography
Indexes
Management-Reports
Proposals
Test-Report
Thesis

PULSE
SA: Square-Wave-Pulse

PULSE-HEIGHT

PULSE-MOTOR
RF: Motors

PULSE-OPTIMIZATION
RF: Optimization

PULSE-REACTOR
SA: TREAT
RF: Reactors

PULSE-SYSTEM

PUMPING-SYSTEM

PUMPS
SA: Boost-Pumps
Centrifugal-Pumps
Cryogenic-Pumps
Feed-Pumps
Impeller-Pumps
Jet-Pumps
Piston-Pump
Spoon-Type-Pump
Turbopumps

PYROGEN-IGNITER
RF: Igniters

PYROLYSIS
SA: Linear-Pyrolysis

PYROLYTIC-CARBON
RF: Carbon
Carbon-Coatings

PYROLYTIC-GRAPHITE
RF: Graphite

PYROLYTIC-MATERIAL
RF: Materials

PYROTECHNICS
SA: Flares
Tracers

QUALIFICATION-TEST
SA: Fuel-Evaluation
RF: Tests

QUALITY-CONTROL
SA: Fatigue-Evaluation
Inspection
RF: Reliability

QUANTITATIVE-ANAL
RF: Analysis
Quantitative-Analysis

Quantitative-Analysis
S: Quantitative-Anal

QUANTUM-MECHANICS
RF: Mechanics

QUANTUM-PLASMA
RF: Plasmas

QUARTZ

QUENCH-NOZZLES
RF: Nozzles

QUENCH-VALVES
RF: Valves

QUENCHING-DISTANCE

QUIESCENT-AIR
RF: Air
Atmosphere
Turbulent-Air

R-F-ENERGY
RF: Radiant-Energy

R-F-GAS-DISCHARGE
RF: Gas-Discharge

R-F-SHIELDING
RF: Shielding

R-F-SPECTROMETER
RF: Spectrometer

RADAR

RADAR-ATTENUATION

RADIAL-FLOW
RF: Flow

RADIAL-SYMMETRY

RADIANCE
SA: Spectral-Radiance

RADIANT-ENERGY
SA: R-F-Energy
RF: Energy
Power-Sources

Radiant-Energy-Conversion
S: Energy-Conversion

RADIANT-HEAT-TRANS
RF: Heat-Transfer
Radiant-Heat-Transfer

Radiant-Heat-Transfer
S: Radiant-Heat-Trans

RADIANT-HEATING
RF: Heating

RADIATION
SA: Emissivity
Gamma-Radiation
Infrared-Radiation
Ionizing-Radiation
Nuclear-Radiation
Solar-Radiation
Thermal-Radiation
Van-Allen-Belt
RF: Space-Environment

RADIATION-ANALYSIS
RF: Analysis

RADIATION-COOLING
RF: Cooling

RADIATION-DENSITY
RF: Density

RADIATION-EFFECTS
SA: Radiation-Hazards

RADIATION-FORCE

RADIATION-HAZARDS
RF: Hazards
Health-Hazards
Launching-Hazards
Radiation-Effects
Reactor-Hazards

RADIATION-LEVELS

RADIATION-PHENOM
RF: Radiation-Phenomena

Radiation-Phenomena
S: Radiation-Phenom

RADIATION-SHIELDS
RF: Shielding

RADIATION-TRANS
RF: Radiation-Transmission

Radiation-Transmission
S: Radiation-Trans

RADICALS
SA: Free-Radicals
Methyl-Radicals

RADIO

RADIO-FREQUENCY
SA: R-F-
U-H-F

RADIO-RPOPAGATION
SA: Antennas

RADIOGRAPHY
RF: Photography

RADIOISOTOPES
RF: Heat-Source
Space-Power-System
Thermoelectric-Gen

RADIOLYSIS

RAIN-EROSION
RF: Erosion

RAMJET
SA: Low-Volume-Ramjet

RAMJET-ENGINE
RF: Engine

RAMJET-MISSILES
RF: Missile

RANGER
RF: Lunar-Probes
Space-Probes

RAPID-BURNING
RF: Burning

RAPID-HEATING
RF: Heating

RARE-EARTH-IONS
RF: Ions

RARE-EARTH-METALS
SA: Yttrium
RF: Metals

RARE-GAS-CHEM
RF: Chemistry
Rare-Gas-Chemistry

Rare-Gas-Chemistry
S: Rare-Gas-Chem

RARE-GAS-COMPOUNDS
SA: Rare-Gas-Fluorides
Xenon
RF: Compounds
Gases

RARE-GAS-FLUORIDES
RF: Fluoride
Rare-Gas-Compounds

RASCAL
RF: Air-to-Ground

RASCHIG-PROCESS

RATE-OF-ONSET
RF: Mechanics

REACTION
SA: Adducts
Chemical-Reaction
Combustion-Reaction
Detonation-Reaction
Explosive-Reaction
Gas-Metal-Reaction
Gas-Reactions
Ignition-Reaction
Interaction
Nuclear-Reaction
RF: Interaction

REACTION-CHAMBER
RF: Chambers

REACTION-CONTROL
RF: Controls

REACTION-ENERGY
RF: Energy

REACTION-KINETICS
RF: Kinetics

REACTION-MECHANISM

REACTION-MOTOR
RF: Motors

REACTION-PROCESSES

REACTION-PRODUCT

REACTION-RATE
SA: Catalysts

REACTIVE-ENVIRON
RF: Environment
Reactive-Environment

Reactive-Environment
S: Reactive-Environ

REACTIVE-PROPEL
RF: Propellants
Reactive-Propellants

Reactive-Propellants
S: Reactive-Propel

REACTOR-ANALYSIS

REACTOR-COOLANT
RF: Coolants

REACTOR-CORES
SA: Carbide-Core

REACTOR-DESIGN
RF: Design

REACTOR-DISPOSAL

REACTOR-DYNAMICS

REACTOR-ENGINE-SYS
RF: Nuclear-Engines
Reactor-Engine-Systems

Reactor-Engine-Systems
S: Reactor-Engine-Sys

REACTOR-EXPERIMENT

Reactor-Fuel-Materials
S: Reactor-Fuel

REACTOR-FUEL
SA: Ceramics
Graphite-Fuel
Plutonium
RF: Fuels
Nuclear-Engines
Reactor-Fuel-Materials

REACTOR-HAZARDS
SA: Radiation-Hazards
RF: Hazards

Reactor-In-Flight-Test
S: RIFT

REACTOR-MATERIALS
RF: Materials

REACTOR-PHYSICS
RF: Physics
Rover-Project

REACTOR-SAFETY
RF: Rover-Project
Safety

REACTORS
SA: Fast-Reactors
Fission-Reactor
Jet-Reactor
KIWI-Reactor
Moderated-Reactor
Moving-Bed-Reactor
Multistage-Reactor
Neutronics
Phoebus-Reactor
Pulse-Reactor
Rover-Reactor
Solid-Core-Reactor
RF: Power-Sources

REAGENTS
RF: Synthesis

RECONNAISSANCE
RF: Surveillance

RECOVERABLE-BOOST
RF: Boosters
Recoverable-Boosters

Recoverable-Boosters
S: Recoverable-Boost

RECOVERY
SA: Al-Recovery
Ca-Recovery
Diborane-Recovery
Heat-Recovery
Sodium-Recovery
Uranium-Recovery
RF: Abort

RECTANGULAR-FINS
RF: Fins

RECTANGULAR-PLATES
RF: Plates

RECYCLE-SYSTEM

Red-Fuming-Nitric-Acid
S: RFNA

REDUCING-AGENTS
SA: Borohydrides

REDUCTION
SA: Data-Reduction
Drag-Reduction
Shear-Reduction
RF: Synthesis

REDUNDANCY
RF: Reliability

REDUNDANT-CIRCUITS
RF: Electrical-Systems

REENTRY

REENTRY-STRESS
RF: Stress

REENTRY-SYSTEMS

REENTRY-VEHICLES
SA: ASSET-Vehicle
RF: Aerospace-Vehicles
Hypersonic-Vehicle
Vehicles

REFERENCES
RF: Bibliography

REFLECTANCE
RF: Absorptance

REFLECTIVE-COATING
RF: Coatings
Coatings-for-Aerospace-Environment
Thermal-Control
Thermal-Control-Coatings

REFLECTIVITY
RF: Emissivity

REFRACTORIES
SA: Alumina
Beryllia
Cermets
Chromite
Chromium-Oxide
Graphite
Magnesia
Silica
Thoria
Zirconia
RF: Ablation-Materials
Materials

REFRACTORY-ALLOYS
RF: Alloys

REFRACTORY-COATING
RF: Coatings

REFRACTORY-COMPOS
RF: Composites
Refractory-Composites

Refractory-Composites
S: Refractory-Compos

REFRACTORY-FIBERS
RF: Fibers

REFRACTORY-LINERS
RF: Liners

REFRACTORY-METALS
SA: Chromium
Columbium
Molybdenum
Tantalum
Tungsten
Uranium
Vanadium
Zirconium
RF: Metals

REFRIGERANTS
RF: Cryocooler-Tech

REFUELING
RF: Fueling

REFUELING-EQUIP
RF: Refueling-Equipment

Refueling-Equipment
S: Refueling-Equip

REGENERATIVE-COOL
    RF: Cooling
        Regenerative-Cooling

Regenerative-Cooling
    S: Regenerative-Cool

REGENERATIVE-HEAT
    RF: Heating
        Regenerative-Heating

Regenerative-Heating
    S: Regenerative-Heat

REGENERATIVE-INJEC
    RF: Injection
        Regenerative-Injection

Regenerative-Injection
    S: Regenerative-Injec

REIGNITION
    RF: Ignition

REINFORCED-FIBERS
    RF: Fibers

REINFORCED-GRAINS
    RF: Grains

REINFORCED-LAMINAT
    RF: Laminates
        Reinforced-Laminates

Reinforced-Laminates
    S: Reinforced-Laminat

REINFORCED-PLASTIC
    RF: Ablation-Materials
        Plastics

REINFORCED-TEFLON
    RF: Teflon

RELEASE-MECHANISM

RELIABILITY
    SA: Failure-Analysis
        Quality-Control
        Redundancy
        Saturn-Reliability
    RF: Failure

RELIEF-SYSTEMS
    SA: Load-Relief-System

REMOTE-HANDLING
    SA: Handling-Devices

RENDEZVOUS
    SA: Docking
    RF: Guidance
        Orbital-Mechanics
        Space-Maneuvering

RENDEZVOUS-PROFILE

RENE-41
    RF: Nickel-Base-Alloy

RESEARCH
    SA: Acetylene-Research
        Additives-Research
        Aerodynamic-Res
        Aerospace-Research
        Applied-Research
        Be-Research
        Borohydride-Res
        Ceramics-Research
        Chemical-Research
        Controls-Research
        Cryogenic-Research
        Explosive-Research
        Injector-Research
        Light-Metal-Res
        Propellant-Res
        Propulsion-Res
        Rocket-Research
        Studies
        Weapons-Research
        Welding-Research

RESEARCH-EFFORT

RESEARCH-ENGINES
SA: Research-Motors
RF: Engines
Research-Motors

RESEARCH-FACILITY
SA: Altitude-Facility
Laboratories
Test-Facility
RF: Laboratories
Test-Facility

RESEARCH-MOTORS
SA: Research-Engines
RF: Motors
Research-Engines

RESEARCH-PROBES
RF: Probes

RESEARCH-PROGRAMS

RESEARCH-SATELLITE
RF: Satellites

RESIN-BINDERS
SA: Acrylic-Resin
Polyurethane-Resin
RF: Alcohol-Acrylates
Binders
Epoxide-Resin-Binders
Methoxyethyl-Acrylate

RESINS
SA: Ca-Resinate
Epoxide-Resin
Laminac-Resin
Phenolic-Resin
Polyester-Resin
Polyurethane-Resin

RESISTANCE
SA: Conductivity
Contact-Resistance
Corrosion-Resist
Electrical-Resist
Impact-Resistance
Impedance
Oxidation-Resist
Shock-Resistance

RESISTANCE-NETWORK
RF: Electrical-Systems

RESISTANCE-WELDING
RF: Welding

RESOLUTION
SA: High-Resolution
RF: Optical-Character

RESONANCE
SA: Magnetic-Resonance

RESONANT-BURNING
RF: Burning

RESTARTABLE-MOTOR
RF: Motors

RESTRICTED-BURNING
RF: Burning

RETRO-ROCKET
RF: Rocket

RETRO-ROCKET-MOTOR
RF: Motors
Rocket-Motor

REVERSE-FLOW
RF: Flow

REYNOLDS-NUMBER
RF: Fluid-Flow

RFNA
SA: Acid subheadings
IRFNA
IWFNA
Nitric-Acid
WFNA
RF: Acids
Anhydrous-Nitric-Acid
Liquid-Oxidizers
Red-Fuming-Nitric-Acid

RFNA-AMMONIA
RF: Ammonia

RFNA-CORROSION
SA: AL-RFNA-Corrosion

RFNA-Hazard
S: Nitric-Acid-Hazard

RHENIUM

RHEOLOGY
RF: Plastic-Flow

RIFT
SA: NERVA-Engine
RF: Reactor-In-Flight-Test

RIGEL
RF: Submarine-Missiles
XSSM-N-6

RING-LASER
RF: Lasers

RIVETED-JOINTS
RF: Joints

ROCKET
SA: Air-to-Air
Air-to-Surface
Aircraft-Rocket
Artillery-Rockets
Booster-Rocket
Folding-Fin-Rocket
Gravity-Fed-Rocket
Hybrid-Rocket
Impulse-Rocket
Liquid-Rocket
Long-Range-Rocket
Modular-Rocket
Monofuel-Rocket
Nuclear-Rocket
Retro-Rocket
Sounding-Rockets
Soviet-Rockets
Surface-to-Air
Surface-to-Surface

ROCKET-ACCURACY
RF: Accuracy

ROCKET-BLAST

ROCKET-CHAMBER
SA: Insulation
RF: Chambers

ROCKET-CLUSTER
RF: Clusters

ROCKET-COMPONENTS
RF: Components
Rocket-System-Components

ROCKET-EFFICIENCY

ROCKET-EJECTOR
RF: Ejectors

ROCKET-ENGINE
SA: Air-Augmented
Screaming
Turborocket
RF: Engine

ROCKET-EXHAUST
RF: Exhaust

ROCKET-FUELS
SA: Amine-Rocket-Fuels
Ammonia-Fuels
RF: Fuels

ROCKET-LINERS
RF: Liners

ROCKET-MOTOR
SA: Retro-Rocket-Motor
RF: Motors

ROCKET-MOTOR-ABL
RF: ABL-X-254-A1
ABL-X-254-A2

ROCKET-MOTOR-BE-1

ROCKET-MOTOR-CASES
RF: Motor-Cases

ROCKET-NOZZLES
RF: Nozzles

ROCKET-OXIDIZERS
RF: Oxidizers

ROCKET-PERFORMANCE
RF: Performance

ROCKET-PISTOL
RF: Small-Arms

ROCKET-POWER-PLANT
RF: Power-Plants

ROCKET-PROPELLANT
RF: Propellants

ROCKET-PROPELLED
RF: Aircraft-Engines

ROCKET-PROPULSION
RF: Propulsion

ROCKET-RESEARCH
RF: Research

ROCKET-SLED

ROCKET-SYSTEM

Rocket-System-Components
S: Rocket-Components

ROCKET-TECHNOLOGY

ROCKET-TESTING
RF: Tests

ROCKET-THRUST
RF: Thrust

ROCKET-VELOCITY
RF: Velocity

ROCKETSONDE
RF: Sounding-Rockets

ROLL-STABILIZATION
RF: Stabilization

ROLLING
SA: Sheet-Rolling
RF: Forming

ROTARY-SCREAMING
RF: Oscillations
Screaming

ROTATING-INJECTOR
RF: Injectors

ROVER
SA: Phoebus-Reactor
RF: Ballistic-Missile
Nuclear-Vehicles

ROVER-FUEL
RF: Burn-Leach-Process
Fuels
Propellants

ROVER-PROJECT
SA: Neutronics
Nuclear-Safety
Reactor-Physics
Reactor-Safety

ROVER-REACTOR
SA: KIWI-Reactor
NERVA-Engine
Phoebus-Reactor
RF: Reactors

RUBBER
SA: Chlorinated-Rubber
GR-S-Rubber
Silicone-Rubber
RF: Elastomers

RUBBER-COMPOUNDS
RF: Compounds
Elastomeric-Comp.

RUBBER-FUEL-BASE
RF: Fuels

RUBBER-FUEL-DRUMS
RF: Fuel-Drums

RUBIDIUM
RF: Alkali-Metals
Light-Metals

RUBY-LASER
RF: Lasers

RUN-AWAY-PHENOMENA
RF: Burning-Rate-Con

RUTILE

SAFE-LIFE
RF: Aging
Propellant-Deterio

SAFETY
SA: Chemical-Safety
Combustion-Safety
Hazard-Control
Missile-Safety
Nuclear-Safety
Reactor-Safety
Stowage-Safety
RF: Abort
Accidents
Hazards

SAFETY-ANALYSIS
RF: Analysis

SAFETY-DEVICES
SA: Ejection-Seat

SAFETY-MANAGEMENT
RF: Management

SAFETY-NEUTRONICS
RF: Reactor-Safety

SAFETY-PRECAUTIONS
SA: Accident-Hazards
Antidotes
Blood-Serum
Decontamination
Fire-Protection
Hazard-Control
Leak-Detection
Vapor-Detection
Warning-Devices
RF: Accident-Hazards

SAFETY-PROCEDURES

SAFETY-PROGRAMS
SA: Flight-Safety-Prog

SAINT
RF: Satellite-Inspection-System

SALICYLATES
SA: Sodium-Salicylate

SALTS
SA: Amine-Salts
Fused-Salt
Lead-Salts
Mercuric-Salts
Nitrate-Salts

SAM-N-6
S: Talos

SANDWICH-CYLINDER
RF: Cylinders

SANDWICH-MATERIALS
RF: Materials

SANDWICH-PANELS
RF: Panels

SANDWICH-SHELLS
RF: Shells

SARAN-FILM
RF: Film

SATELLITE-BASES
RF: Bases

SATELLITE-CONTROL
RF: Attitude-Control
Control-Systems
Spacecraft-Control

Satellite-Inspection-System
S: SAINT

SATELLITE-ORBITS
RF: Orbits

SATELLITE-PROPULS
RF: Propulsion
Satellite-Propulsion

Satellite-Propulsion
S: Satellite-Propuls

SATELLITES
  SA: Earth-Satellites
      Evasive-Satellite
      Research-Satellite
  RF: Orbital-Vehicles
      Space-Stations

SATURN
  RF: Apollo
      Boosters

SATURN-COSTS
  RF: Costs

SATURN-DESIGN
  RF: Design

SATURN-LOX-TANK
  RF: LOX-Tanks

SATURN-MISSIONS
  RF: Space-Missions

SATURN-PAYLOAD
  RF: Payload

SATURN-PROBLEMS

SATURN-RELIABILITY
  RF: Reliability

SCALEUP
  SA: Model-Scaleup
      Process-Scaleup

SCALING
  SA: Model-Scaling
      Vehicle-Scaling

SCALING-CRITERIA

SCALING-PROCEDURES

SCANDIUM
  RF: Light-Metals

SCATTERERS
  RF: Absorber

SCHOCH-PROCESS
  RF: Acetylene

SCOUT
  RF: Boosters

SCREAMING
  SA: Rotary-Screaming
  RF: Rocket-Engine

SCREAMING-TENDENCY

SCRUBBING
  SA: Chemical-Scrubbing

SEALANTS
  RF: Adhesives

SEAL-DESIGN
  RF: Design

SEALED-FOAM
  RF: Foams

SEALS
  SA: Chamber-Seals
      Cryogenic-Seals
      Elastic-Seals
      Gaskets
      Lockseal
      O-Rings
  RF: Gaskets
      Leakage
      Mechanical-Fitting

SECONDARY-FLOW
  RF: Flow

SECONDARY-VORTEX
  RF: Vortex

SEMI-TRAILER
  RF: Ground-Support
      Servicing-Trailer

SEMI-TRAILER-TANKS
  RF: Tanks

SEMICONDUCTIVITY
  RF: Conductivity

SEMICONDUCTORS

SENSITIVITY
SA: Compression-Sensit
Desensitization
Detonation-Sensit
Explosive-Sensit
Ignition-Sensit
Impact-Sensitivity
Mission-Sensit
Notch-Sensitivity
Propellant-Sensit
Shock-Sensitivity
Temperature-Sensit
Thermal-Sensitiv
RF: Hazard-Class

SENSITIVITY-STUDY
RF: Studies

SERGEANT
RF: Surface-to-Surface

SERVICING-EQUIP
RF: Ground-Support
Servicing-Equipment

Servicing-Equipment
S: Servicing-Equip

SERVICING-TRAILER
SA: Semi-Trailer

SERVO-VALVES
RF: Servomechanisms
Valves

SERVOMECHANISMS
SA: Servo-Valves
RF: Controls

SHAPED-CHARGES
SA: Cone-Charges
RF: Solid-Propellants

SHEAR
RF: Forces

SHEAR-DISTORTION

SHEAR-FLOW
RF: Flow

SHEAR-PROPERTIES

SHEAR-REDUCTION
RF: Reduction

SHEET-ALLOYS
RF: Alloys

SHEET-METALS
RF: Metals

SHEET-ROLLING
RF: Rolling

SHEET-ROLLING-PROG
RF: Sheet-Rolling-Program

Sheet-Rolling-Program
S: Sheet-Rolling-Prog

SHEETS
SA: Be-Sheets
Data-Sheets
Thin-Sheets
Titanium-Sheet
Tungsten-Sheet

SHELL-MEMBRANES
RF: Membranes

SHELL-STRUCTURES
RF: Structures

SHEELS
SA: Cylindrical-Shell
Elastic-Shells
Ellipsoidal-Shells
Pressurized-Shells
Sandwich-Shells
Tapered-Shells
Theory-of-Shells
Thin-Shells

SHELLS-OF-REVOLUT
RF: Bodies-of-Revolut
Shells-of-Revolution

Shells-of-Revolution
S: Shells-of-Revolut

SHIELD
SA: Heat-Shields
RF: Absorber

SHIELD-MATERIALS
SA: Heat-Shield-Matls
RF: Absorbent
Absorber

SHIELDING
SA: R-F-Shielding
Radiation-Shields

SHILLELAGH
RF: Tactical-Missiles

SHOCK
SA: Ground-Shock
Launching-Shock
Load-Relief-System
Temperature-Shock
Thermal-Shock

SHOCK-ABSORBER
RF: Absorber

SHOCK-ATTENUATION
RF: Detonation

SHOCK-HARDENING
RF: Explosive-Forming

SHOCK-ISOLATION
SA: Elastic-Systems

SHOCK-RESISTANCE
RF: Resistance

SHOCK-SENSITIVITY
RF: Sensitivity

SHOCK-TUBE
RF: Tube

SHOCK-TUNNEL
RF: Wind-Tunnel

SHOCK-WAVE
RF: Waves

SHORT-TIME-CREEP
RF: Creep

SHRIKE
RF: Air-to-Ground

SHUT-OFF-VALVE
RF: Valves

SIDEWINDER
RF: Guided-Missiles

SILICA
RF: Refractories

SILICA-GEL
RF: Gels

SILICON
RF: Light-Metals

SILICON-ADDITIVES
RF: Additives

SILICON-BORIDE
RF: Borides

SILICON-CARBIDE
RF: Carbides

SILICONE-RUBBER
RF: Rubber

SILOS
RF: Launch-Sites

SILVER

SILVER-CATALYST
RF: Catalysts

SILVER-NITRATES
RF: Nitrates

SIMULATION
SA: Altitude-Simulat
Artificial-Environ
Flight-Simulation
Thermal-Modeling
RF: Models
Test-Methods

SIMULATION-METHODS

SIMULATORS
SA: Environmental-Cham
RF: Test-Equipment

SINTERING
RF: Alloying-Process

SKIN-FRICTION
RF: Friction

SKYBOLT
RF: Air-Launched

SLIPSTREAM
RF: Aerodynamics
Air-Stream

SLOSHING
SA: Fluid-Oscillations
Fuel-Motion
Fuel-Oscillations
RF: Fluid-Slosh

SLOW-COMBUSTION
RF: Combustion

SLUDGE-FORMATION
RF: Formation

SLURRY-FUELS
RF: Fuels

Slush-Hydrogen
S: Hydrogen-Slush

SMALL-ARMS
SA: Rocket-Pistol
RF: Weapons

SMOKELESS-JATO
RF: JATO

SMOKELESS-PROPEL
RF: Smokeless-Propellents
Solid-Propellants

Smokeless-Propellants
S: Smokeless-Propel

SNAP
RF: Auxiliary-Power
Nuclear-Power
Systems-for-Nuclear-Auxiliary-Power

SNARK
RF: ICBM

SODIUM
RF: Alkali-Metals
Light-Metals

SODIUM-ACETYLIDES
RF: Acetylides

SODIUM-AMIDE
RF: Amides

SODIUM-AZIDE
RF: Azides

SODIUM-AZIDE-GRAIN
RF: Grains

SODIUM-BORATE
RF: Borates

SODIUM-BOROHYDRIDE
RF: Borohydrides

SODIUM-CARBIDE
RF: Carbides

SODIUM-CARBONATE
RF: Carbonates

SODIUM-CHLORIDE
RF: Chlorides

SODIUM-FLUOBORATE
RF: Fluoborate

SODIUM-HYDRIDE
RF: Metal-Hydrides

SODIUM-HYDROXIDE
RF: Hydroxides

SODIUM-METABORATE
RF: Metaborate

SODIUM-NITRATE
RF: Nitrate

SODIUM-REACTIONS
RF: Chemical-Reaction

SODIUM-RECOVERY
RF: Recovery

SODIUM-SALICYLATE
RF: Salicylates

SODIUM-STANNATE
RF: Stannates

SOLAR-ENERGY
RF: Energy
Power-Sources

SOLAR-FLARES
RF: Space-Environment

SOLAR-HEATING
RF: Heating

SOLAR-PROPULSION
RF: Propulsion

SOLAR-RADIATION
RF: Radiation

SOLAR-SIMULATION
SA: Carbon-Arc-Lamps
RF: Environmental-Test

SOLID-BORANE

SOLID-CORE-REACTOR
RF: Reactors

SOLID-OXIDIZERS
SA: Ammonium-Nitrate
Ammonium-Perchlor
Li-Perchlorate
Pellets
Potassium-Nitrate
Potassium-Perchlor
RF: Oxidizers
Solid-Propellants

Solid-Propellant-Hazards
S: Propellant-Hazards

SOLID-PROPELLANTS
SA: Aircraft-Fuels
ARCITE-368
ARCOCEL-333E
ARCOCEL-365
Asphalt
B-N-H-Propellants
Pellets
Propellant-Grains
Shaped-Charges
Smokeless-Propel
Solid-Oxidizers
Sponge-Propellant
RF: Fuels
Propellants

SOLID-SOLUTIONS
RF: Solutions

SOLID-STATE

SOLIDS

SOLUBILITY
SA: Diborane-Solubil

SOLUTIONS
SA: Chemical-Solutions
Heat-of-Solution
Liquid-Solutions
Numerical-Solution
Solid-Solutions

SOLVENT-MEDIA

SOLVENTS
SA: Organic-Solvents

SONIC-ENERGY
RF: Energy

SORPTION
SA: Absorption
Adsorption

SOUND
SA: Acoustics

SOUND-DISPERSION

SOUND-VELOCITY
RF: Velocity

SOUNDING-ROCKETS
SA: Arcon
Iris
Rocketsonde
RF: Rockets

SOURCE
SA: Energy-Sources
Error-Sources
Ion-Source
Ionization-Sources
Power-Sources
Thermal-Source

SOVIET-ROCKETS
RF: Rocket

SPACE-AGE

SPACE-BIOLOGY
RF: Bioastronautics

Space-Docking
S: Docking

SPACE-ENVIRONMENT
SA: Radiation
Solar-Flares
Vacuum-Environment
RF: Aerospace-Environment
Environment

SPACE-EXPLORATION

SPACE-LABORATORIES
RF: Laboratories

SPACE-MAINTENANCE
RF: Maintenance

SPACE-MANEUVERING
SA: Docking
Interception
Rendezvous

SPACE-MATERIALS
RF: Materials

SPACE-MISSIONS
SA: Lunar-Missions
Saturn-Missions
RF: Manned-Missions

SPACE-NAVIGATION
SA: Orbital-Mechanics
RF: Navigation

SPACE-PATROLS
RF: Active-Defense
Manned-Missions

SPACE-POWER-SYSTEM
SA: Radioisotopes
RF: Power-Systems

SPACE-PROBES
SA: Able-1-Project
Juno
Mariner
Ranger
Surveyor
Voyager
RF: Probes

SPACE-PROGRAMS

SPACE-PROPULSION
SA: Squid
RF: Propulsion

SPACE-SCIENCES
SA: Aerospace-Research
Bioastronautics
Orbital-Mechanics

SPACE-STATIONS
SA: Satellites

SPACE-SYSTEMS

SPACE-TECHNOLOGY

Space-Vehicles
S: Spacecraft

SPACECRAFT
SA: Apollo
Manned-Vehicles
Unmanned-Vehicles
RF: Aerospace-Vehicles
Space-Vehicles

SPACECRAFT-CONTROL
SA: Satellite-Control
RF: Control-Systems

SPACECRAFT-COSTS
RF: Costs

SPACECRAFT-ENGINES
RF: Engine

SPALLATION
RF: Nuclear-Reaction

SPARK-EROSION
RF: Machining

SPARK-IGNITION
RF: Ignition

SPARK-SOURCE

SPARKS
SA: Electric-Sparks

SPARROW
RF: Air-to-Air

SPECIFIC-ENERGY
RF: Energy

SPECIFIC-GRAVITY
RF: Gravity

SPECIFIC-HEAT
RF: Heat

SPECIFIC-IMPULSE
RF: Acetylene

SPECIFIC-WEIGHT
RF: Weight

SPECIFICATIONS
RF: Standards

SPECTRA
SA: Borane-Spectra
Emission-Spectra
Flame-Spectra
Infrared-Spectra
Mass-Spectra
Vibration-Spectra

SPECTRAL-ANALYSIS
RF: Analysis

SPECTRAL-EMITTANCE
RF: Emittance

SPECTRAL-OPACITIES
RF: Opacities

SPECTRAL-RADIANCE
RF: Radiance

SPECTROGRAPHY
SA: Mass-Spectrography

SPECTROMETER
SA: Mass-Spectrometer
R-F-Spectrometer
Vapor-Detection
RF: Instruments

SPECTROMETRIC-ANAL
RF: Analysis
Spectrometric-Analysis

Spectrometric-Analysis
S: Spectrometric-Anal

SPECTROMETRY

SPECTROPHOTOMETERS
RF: Instruments

SPECTROSCOPY
SA: Flame-Spectroscopy
Infrared-Spectros

SPECTRUM-ANALYZER
RF: Analyzers

SPEED
SA: Detonation-Speed
Flame-Speed
High-Speed
Transonic-Speeds
Velocity
RF: Velocity

SPHERES
SA: Hemispheres
Inflated-Sphere
Liquid-Spheres

SPHERICAL-SHELLS
RF: Shells

SPIKE-NOZZLE-MOTOR
SA: Leapfrog
RF: Motors

SPIN-DYNAMICS

SPONGE-PROPELLANT
RF: Solid-Propellants

SPONTANEOUS-IGNIT
RF: Ignition
Spontaneous-Ignition

Spontaneous-Ignition
S: Spontaneous-Ignit

SPOON-TYPE-PUMPS
RF: Pumps

SPRAY-COMBUSTION
RF: Combustion

SPRAY-COOLED
RF: Cooling

SPRAY-FORMATION
SA: Atomization
RF: Formation

SPRAY-IGNITION
RF: Ignition

SPRAY-INJECTOR
RF: Injectors

SPRAYS
SA: Aerosols
Atomized-Fuel
Burning-Sprays

SQUARE-WAVE-PULSE
RF: Pulse

SQUID
RF: Space-Propulsion

SS-AFC-77
RF: Stainless-Steel

SST
RF: High-Speed-Aircraft
Supersonic-Aircraft
Supersonic-Transports
Transports

STABILITY
SA: Chemical-Stability
Dynamic-Stability
Elastic-Stability
Flame-Stability
Flow-Stability
Instability
Longitudinal-Stab
Oxidizer-Stability
Ozone-Stability
Static-Stability
Storage-Stability
Temperature-Stabil
Thermal-Stability
Vehicle-Stability

STABILITY-ANALYSIS
RF: Analysis

STABILITY-GRADING

STABILITY-LIMITS

STABILITY-TESTS
RF: Tests

STABILIZATION
SA: Roll-Stabilization

STABILIZERS

STAGED-COMBUSTION
RF: Combustion

STAGNATION-TEMP
RF: Stagnation-Temperature
Temperature

Stagnation-Temperature
S: Stagnation-Temp

STAINLESS-STEEL
SA: SS-AFC-77
RF: Alloys
Steels

STALL

STALL-LIMITS

STANDARD-ATMOS
RF: ARDC-Model-Atmosphere
Atmosphere
Standard-Atmosphere

Standard-Atmosphere
S: Standard-Atmos

STANDARDIZATION

STANDARDS
SA: Specifications
Welding-Standards

STANNATES
SA: Lead-Stannate
Sodium-Stannate

Star-Grains
S: Cruciform-Grains

STAR-TRACKERS
RF: Guidance

STARTER-MOTOR
RF: Motors

STARTING-FLOW
RF: Flow

STARTING-FLUID
RF: Fluids

STATIC-PRESSURE
RF: Pressure

STATIC-STABILITY
RF: Stability

STATIC-TEST-FIRING
RF: Engine
Motors
Test-Firing

STATISTICAL-DESIGN
RF: Design

STATISTICAL-STUDY
RF: Studies

STATISTICS

STEADY-STATE-BURN
RF: Burning
Steady-State-Burning

Steady-State-Burning
S: Steady-State-Burn

STEARIC-ACID
RF: Acids

STEEL-AISI-1020

STEEL-AISI-4130

STEEL-CASTING
RF: Casting

STEEL-PLATES
RF: Plates

STEELS
SA: Carbon-Steel
Cold-Worked-Steels
Low-Alloy-Steel
Maraging-Steels
Stainless-Steel
Tool-Steel
RF: Alloys

STEERING-MOTOR
RF: Motors

STERILIZATION
SA: Thermal-Steriliz

STORABILITY

STORAGE
SA: Acid-Storage
Chlorine-Storage
FNA-Storage
Helium-Storage
Hot-Storage
Missile-Storage
Propellant-Storage
Tanks

STORAGE-DRUMS
RF: Drums

STORAGE-FACILITIES

STORAGE-PROPERTIES

STORAGE-STABILITY
RF: Stability

STORAGE-SYSTEM

STORAGE-TANKS
RF: Tanks

STORAGE-TEST
RF: Test

STOWAGE-SAFETY
RF: Safety

STRAIN-AGING
RF: Aging

STRAIN-GAGE
RF: Gages

STRAIN-RATE
SA: High-Strain-Rate

STREAMLINED-BODIES
SA: Drag

STRENGTH
SA: Compressive-Streng
Fatigue-Strength
Fracture-Toughness
High-Strength
Impact-Strength
Medium-Strength
Tensile-Strength
Yield-Strength

STRESS
SA: Biaxial-Stress
Reentry-Stress
Thermal-Stress

STRESS-ANALYSIS
RF: Analysis

STRESS-CORROSION
RF: Corrosion

STRESS-EFFECTS

STRESS-FIELDS

STRESS-GAGE
RF: Gages

STRESS-INTERACTION

STRESS-RUPTURE
RF: Fracture

STRETCH-FORMING
RF: Forming

STROBE-CONTROL
RF: Cameras
Controls

STRONTIUM
RF: Light-Metals

STRUCTURAL-ANAL
RF: Analysis
Structural-Analysis

Structural-Analysis
S: Structural-Anal

STRUCTURAL-DESIGN
  RF: Design

STRUCTURAL-JOINTS
  RF: Joints

STRUCTURAL-LAMINAT
  RF: Laminates
      Structural-Laminates

Structural-Laminates
  S: Structural-Laminat

STRUCTURAL-METALS
  RF: Metals

STRUCTURAL-PLASTIC
  RF: Plastics

STRUCTURES
  SA: Aerospace-Structur
      Aircraft-Structure
      Be-Structures
      Chemical-Structure
      Clustering-Struct
      Crystal-Structure
      Cylinder-Structure
      Dynamic-Response
      Elastic-Structures
      Honeycomb-Struct
      Metal-Column
      Molecular-Struct
      Plates
      Protective-Struct
      Shell-Structures

STUDIES
  SA: Aging-Study
      Animal-Studies
      Ballistic-Studies
      Borane-Studies
      Cavitation-Studies
      Coating-Studies
      Combustion-Studies
      Corrosion-Studies
      Design-Studies
      Detonation-Studies
      Diffuser-Studies
      Engine-Studies
      Enzyme-Studies
      Flame-Studies
      Flow-Studies
      Graphite-Studies
      Ignition-Studies
      Infrared-Studies
      Kinetic-Studies
      Logistics-Studies
      Low-Temp-Studies
      Mockup-Studies
      Optical-Studies
      Parametric-Studies
      Sensitivity-Study
      Statistical-Study
      Tests
      Thermal-Studies
  RF: Research

STYRENE
  SA: Polystyrene

STYRENE-MONOMER
  RF: Monomers

SUBASSEMBLIES
  SA: Engine-Subassembly

Subatmospheric-Pressure
  S: Low-Pressure

SUBCOOLED-WATER
  RF: Water

SUBMARINE-MISSILES
  SA: Polaris
      RIGEL
  RF: Missile

SUBMARINE-POWER
  RF: Power

SUBMARINE-PROPULS
  RF: Propulsion
      Submarine-Propulsion

Submarine-Propulsion
  S: Submarine-Propuls

SUBMARINES
  RF: Undersea-Warfare

SUBSONIC-FLOW
  RF: Flow

SUBSYSTEMS
SA: Engine-Subsystem
Vehicle-Subsystems

SULFATE-WOOD-PULPS
RF: Nitrocellulose
Wood-Pulps

SULFIDES
SA: Antimony-Sulfide
Metal-Sulfides
Polysulfide

SULFUR

SULFUR-COMPOUNDS
RF: Compounds

SULFURIC-ACID
RF: Acids

SUPER-FUELS
RF: Fuels

SUPERALLOYS
SA: Highstrength-Alloy
Nonferrous-Alloys
RF: Alloys

Superatmospheric-Pressure
S: Atmospheric-Press
High-Pressure
Pressure

SUPERCONDUCTORS
RF: Conductors

Supersonic-Aircraft
S: SST

SUPERSONIC-DRAG
RF: Drag

SUPERSONIC-FLIGHT
RF: Flight
High-Mach-Number
High-Speed-Flight

SUPERSONIC-FLOW
RF: Flow

SUPERSONIC-NOZZLE
RF: Nozzles

Supersonic-Transports
S: SST

SURFACE-EFFECTS

SURFACE-TEMP
RF: Surface-Temperature
Temperature

Surface-Temperature
S: Surface-Temp

SURFACE-TENSION

SURFACE-TO-AIR
SA: Talos
Tartar
Terrier
RF: Missile
Rocket

SURFACE-TO-SURFACE
SA: Little-John
Polaris
Sergeant
Titan
RF: Missile
Rocket

SURVEILLANCE
SA: Intercept-System
Reconnaissance
RF: Active-Defense
Global-Surveillance

SURVEYOR
RF: Lunar-Probes
Space-Probes

SUSPENSIONS
SA: Emulsions
RF: Colloidal-Suspensions

SWEAT-COOLING
RF: Cooling

SYMPOSIA
RF: Symposium

Symposium
S: Symposia

SYNTHESIS
SA: Chemical-Synthesis
Low-Temp-Synthesis
Reagents
Reduction

SYNTHETIC-CHEM
RF: Chemistry
Metallo-Organic-Chemistry
Synthetic-Chemistry

Synthetic-Chemistry
S: Synthetic-Chem

SYSTEM-CONSID
RF: Considerations
Human-Factors
System-Considerations

System-Considerations
S: System-Consid

SYSTEM-DESIGN
RF: Design

SYSTEM-COSTS
RF: Costs

SYSTEMS-ANALYSIS
RF: Analysis
Management

Systems-for-Nuclear-Auxiliary-Power
S: SNAP

TACTICAL-MISSILES
SA: Condor
Maverick
Shillelagh
RF: Missile

TACTICAL-SYSTEMS
RF: Limited-Warfare

TALIANI-TEST
RF: Tests

TALOS
SA: Typhon
RF: Bumblebee-Project
SAM-N-6
Surface-to-Air

TANK-DESIGN
RF: Design

TANK-DEVELOPMENT

TANK-DRAINAGE

TANK-LINERS
RF: Fuel-Tanks
Liners

TANK-MATERIALS
RF: Materials

TANK-OUTLET

TANK-TESTS
RF: Tests

TANKAGE

TANKAGE-PROGRAM

TANKS
SA: Acid-Tanks
Al-Tanks
Auxiliary-Tanks
Containers
Cryogenic-Tanks
Cylindrical-Tanks
Drop-Tanks
Drums
Expulsion-Tank
Feed-Tanks
Fuel-Tanks
Insulated-Tanks
Light-Weight-Tanks
LOX-Tanks
Nitrogen-Tanks
Plastic-Tanks
Pressure-Vessels
Propellant-Tanks

Semi-Trailer-Tanks
Storage-Tanks
Titanium-Tanks
Welded-Tanks
RF: Storage

TANTALUM
RF: Refractory-Metals

TANTALUM-ALLOY
RF: Alloys

TANTALUM-BORIDE
RF: Borides

TANTALUM-CARBIDES
RF: Carbides

TANTALUM-DIAPHRAGM
RF: Diaphragms

TAPERED-CHANNEL
RF: Channel

TAPERED-SHELLS
RF: Shells

TARTAR
RF: Surface-to-Air

TARTAR-PLENUM-CHAM
RF: Chambers
Tartar-Plenum-Chamber

Tartar-Plenum-Chamber
S: Tartar-Plenum-Cham

Technical-Proposals
S: Proposals

TEFLON
SA: Reinforced-Teflon

TELEMETRY
RF: Communications

TEMPERATURE
SA: Air-Temperature
Ambient-Temp
Burner-Tip-Temp
Burning-Temps
Combustion-Temp
Critical-Temp
Cryogenic-Temp
Cyclic-Temperature
Elevated-Temp
Flame-Temperature
Fuel-Temperature
High-Temperature
Ignition-Temp
Low-Temperature
Melting-Temp
Stagnation-Temp
Surface-Temp
Variable-Temp
Wall-Temperature

TEMPERATURE-COEF
RF: Coefficients
Temperature-Coefficients

Temperature-Coefficients
S: Temperature-Coef

TEMPERATURE-CON
RF: Control-Systems
Temperature-Control

Temperature-Control
S: Temperature-Con

TEMPERATURE-MEAS
SA: Calorimeter
Thermocouple
RF: Temperature-Measurement

Temperature-Measurement
S: Temperature-Meas

TEMPERATURE-PROFIL
RF: Temperature-Profiles

Temperature-Profiles
S: Temperature-Profil

TEMPERATURE-RANGE

TEMPERATURE-RATE

TEMPERATURE-SENSIT
RF: Sensitivity
Temperature-Sensitivity

Temperature-Sensitivity
    S: Temperature-Sensit

TEMPERATURE-SHOCK
    RF: Shock

TEMPERATURE-STABIL
    RF: Stability
        Temperature-Stability

Temperature-Stability
    S: Temperature-Stabil

TEMPERATURE-SURVEY

TENSILE-PROPERTIES

TENSILE-RUPTURE

TENSILE-STRENGTH
    RF: Strength

TENSILE-TESTS
    RF: Tests

TENSIOMETERS
    RF: Instruments

TENSOR-ANALYSIS
    RF: Analysis
        Theory-of-Shells

TERMINAL-BALLISTIC
    RF: Ballistics

TERMINAL-GUIDANCE
    RF: Guidance

TERNARY-PHASE

TERNARY-SYSTEMS

TERRIER
    RF: Surface-to-Air

TERRIER-BOOSTER
    RF: Boosters

TEST-CELLS
    SA: Altitude-Cells

TEST-DATA

TEST-EQUIPMENT
    SA: Altitude-Test-Cell
        Altitude-Test-Cham
        Simulators
        Test-Stands

TEST-FACILITY
    SA: Altitude-Facility
        Laboratories
        Research-Facility
    RF: Laboratories
        Research-Facility

TEST-FIRING
    SA: Static-Test-Firing

TEST-METHODS
    SA: Simulation

TEST-MISSIONS
    RF: Missions

TEST-PROCEDURES

TEST-PROGRAM

TEST-PROJECTS

TEST-REPORT
    RF: Publications

TEST-RESULTS

TEST-SPECIMENS

TEST-STANDS
    RF: Test-Equipment

TEST-VEHICLES
    RF: Vehicles

TESTS
    SA: Accelerated-Tests
        Acceleration-Tests
        Acetylene-Tests
        Al-Tensile-Tests
        Altitude-Tests
        Ballistic-Test
        Combustion-Tests

Component-Tests
Compression-Tests
Cooling-Tests
Corrosion-Testing
Demonstration-Test
Detonation-Tests
Engine-Testing
Environmental-Test
Explosive-Tests
Fatigue-Tests
Feasibility-Test
Flight-Tests
Fuel-Tests
Full-Power-Run
Heating-Tests
Ignition-Tests
Injector-Tests
Module-Tests
Nuclear-Tests
Performance-Tests
Porosity-Test
Qualification-Test
Rocket-Testing
Stability-Tests
Storage-Test
Taliani-Test
Tank-Tests
Tensile-Tests
Vibration-Tests
Vortex-Tests
Welding-Test
RF: Studies

TETRABORANE
RF: Borane

TETRABORIDE
RF: Borides

TETRAFLUORIDE
RF: Fluoride

TETRANITRATE
RF: Nitrate

TETRAZOLES

THALLIUM

THEORETICAL-ANAL
RF: Analysis
Theoretical-Analysis

Theoretical-Analysis
S: Theoretical-Anal

Theoretical-Flow
S: Flow-Theory

THEORY-OF-SHELLS
SA: Tensor-Analysis
RF: Shells

THERMAL-ANALYSIS
RF: Analysis

THERMAL-BARRIER

THERMAL-CONDUCT
RF: Air
Heat-Conductivity
Thermal-Conductivity

Thermal-Conductivity
S: Thermal-Conduct

THERMAL-CONTROL
SA: Reflective-Coating
RF: Control-Systems

Thermal-Control-Coatings
S: Reflective-Coating

THERMAL-DATA

THERMAL-DECOMP
RF: Decomposition
Thermal-Decomposition

Thermal-Decomposition
S: Thermal-Decomp

THERMAL-DEGRADAT
RF: Degradation
Thermal-Degradation

Thermal-Degradation
S: Thermal-Degradat

THERMAL-DIFFUSION
RF: Diffusion

THERMAL-EFFECTS

THERMAL-ENVIRON
RF: Environment
Thermal-Environment

THERMAL-EROSION
RF: Erosion

THERMAL-EXPANSION
RF: Expansion

THERMAL-EXPLOSIONS
RF: Explosion

THERMAL-IGNITION
RF: Ignition

THERMAL-MODELING
RF: Simulation

THERMAL-OXIDATION
RF: Oxidation

THERMAL-PERFORM
RF: Performance
Thermal-Performance

Thermal-Performance
S: Thermal-Perform

THERMAL-PROTECTION
RF: Coatings
Insulation
Protection

THERMAL-RADIATION
RF: Radiation

THERMAL-SENSITIV
RF: Sensitivity
Thermal-Sensitivity

Thermal-Sensitivity
S: Thermal-Sensitiv

THERMAL-SHOCK
RF: Shock

THERMAL-SOURCE
RF: Source

THERMAL-STABILITY
RF: Stability

THERMAL-STERILIZ
RF: Sterilization
Thermal-Sterilization

Thermal-Sterilization
S: Thermal-Steriliz

THERMAL-STRESS
RF: Stress

THERMAL-STUDIES
RF: Studies

THERMAL-UPDRAFT
RF: Updraft

THERMIONIC-POWER
RF: Power

THERMOCHEMISTRY
RF: Chemistry

THERMOCOUPLE
RF: Temperature-Meas

THERMODYNAMIC-ANAL
RF: Analysis
Thermodynamic-Analysis

Thermodynamic-Analysis
S: Thermodynamic-Anal

THERMODYNAMIC-FUNC
RF: Functions
Thermodynamic-Functions

Thermodynamic-Functions
S: Thermodynamic-Func

THERMODYNAMIC-PROP
RF: Thermodynamic-Properties

Thermodynamic-Properties
S: Thermodynamic-Prop

THERMODYNAMICS
SA: Aerothermodynamics
Entropy
RF: Aerothermodynamics

THERMOELECTRIC-GEN
SA: Radioisotopes
RF: Generators
Thermoelectric-Generator

Thermoelectric-Generator
S: Thermoelectric-Gen

THERMOELEMENTS

THERMOJET-ENGINE
RF: Engine

THERMOLUMINESCENCE
RF: Luminescence

Thermonuclear-Propulsion
S: Nuclear-Propulsion

THERMOPLASTICS
RF: Plastics

THESIS
RF: Publications

THIN-SHEETS
SA: Coated-Thin-Sheets
RF: Sheets

THIN-SHELLS
RF: Shells

THOR
RF: IRBR

THOR-AGENA
RF: Boosters

THORIA
RF: Refractories

THORIUM

THREE-BODY-PROBLEM
SA: Perturbation
RF: Bodies

THROAT-EROSION
RF: Erosion

THROAT-THROTTLING
RF: Throttling

THROATS
SA: Nozzle-Throats

THROTTLE-VALVE
RF: Valves

THROTTLING
SA: Injector-Throttle
Throat-Throttling

THRUST
SA: Dual-Thrust-Motor
High-Thrust
Injector-Thrust
Low-Thrust
Microthrust
Optimum-Thrust
Rocket-Thrust
Variable-Thrust

THRUST-AUGMENT
SA: Afterburner
JATO
RF: Thrust-Augmentation

Thrust-Augmentation
S: Thrust-Augment

THRUST-CHAMBER
SA: Ablation-Materials
RF: Chambers

THRUST-COEFFICIENT
RF: Nozzle-Design

THRUST-CONTROL
RF: Controls

THRUST-CYLINDERS
RF: Cylinders

THRUST-EFFICIENCY

THRUST-MODULATION

THRUST-RATING

TI-3AL-11CR-13V
  RF: Beta-Titanium

TI-6AL-4V
  RF: Titanium-Alloy

TI-7AL-(3-4)MO
  RF: Titanium-Alloy

TIG-WELDING
  RF: Welding

TIME-INTERVALS
  RF: Accuracy

TITAN
  RF: ICBM
    Surface-to-Surface

TITANIUM

TITANIUM-ALLOY
  SA: Alpha-Titanium
    Beta-Titanium
    TI-6AL-4V
    TI-7AL-(3-4)MO
  RF: Alloys

TITANIUM-BORIDE
  RF: Borides

TITANIUM-CARBIDE
  RF: Carbides

TITANIUM-CORROSION
  RF: Corrosion

TITANIUM-MACHINING
  RF: Alloy-Machining
    Machining

TITANIUM-SHEET
  RF: Sheets

TITANIUM-TANKS
  RF: Tanks

TITANOUS-CHLORIDE
  RF: Chlorides

TNT
  S: Trinitrotoluene

TOLUENE
  SA: Trinitrotoluene
  RF: Hydrocarbons

TOOL-STEEL
  RF: Steels

TOOLING

TOOLING-COSTS
  SA: Low-Cost-Tooling
  RF: Costs

TORPEDO-BOOSTER
  RF: Boosters

TOW-FLIGHT
  RF: Flight

TOWING

TOWING-CHANNEL
  RF: Channel

TOXICITY
  SA: Ammonia-Toxicity
    Antidotes
    Be-Toxicity
    Blood-Serum
    Borane-Toxicity
    Chemical-Safety
    Fuel-Toxicity
    Health-Hazards
  RF: Health-Hazards

TOXICOLOGY

TRACERS
  RF: Ammunition
    Pyrotechnics

TRAJECTORIES
  SA: Optimum-Traject

TRANSCRIBERS
  SA: Magnetic-Tape

TRANSDUCERS
SA: Digital-Transducer
Force-Transducer
Nickel-Transducers

TRANSITION-METALS
RF: Metals

TRANSMISSION

TRANSMITTANCE
RF: Absorptance

TRANSMITTERS

TRANSONIC-AIRCRAFT
RF: Aircraft

TRANSONIC-FLOW
RF: Flow

TRANSONIC-SPEEDS
RF: Speed

TRANSPARENT-NOZZLE
RF: Nozzles

TRANSPIRATION-COOL
RF: Cooling
Transpiration-Cooling

Transpiration-Cooling
S: Transpiration-Cool

TRANSPORT-PHENOM
RF: Transport-Phenomena

Transport-Phenomena
S: Transport-Phenom

TRANSPORT-PROPERT
RF: Transport-Properties

Transport-Properties
S: Transport-Propert

TRANSPORTS
SA: Orbital-Transport
SST

TRANSPORTATION

TREAT
RF: Pulse-Reactor

TRIAZINE
RF: Azine

TRICHLORIDES
RF: Chlorides

TRIFLUORIDE
RF: Fluoride

TRIETHLYALUMINUM
RF: Aluminum

TRIMETHLY-AL-HYDRA
RF: Aluminum
Trimethly-Aluminum-Hydrazine

Trimethyl-Aluminum-Hydrazine
S: Trimethyl-Al-Hydra

TRIMETHYL-BORATE
RF: Borates

TRINITROTOLUENE
RF: Explosives
TNT
Toluene

TRITIUM
RF: Hydrogen-Isotope

TRITIUM-COMPOUNDS

TUBE
SA: Al-Tubing
Flame-Tube
Fuel-Tubes
Heated-Tube
Piston-Tube
Porous-Tube
Shock-Tube
Uranium-Tubes
Vortex-Tubes

TUBE-IGNITER
RF: Igniters

TUNGSTEN
RF: Refractory-Metals

TUNGSTEN-ALLOY
RF: Alloys

TUNGSTEN-BORIDE
RF: Borides

TUNGSTEN-SHEET
RF: Sheets

TURBINE-FUELS
RF: Fuels

TURBINES
SA: Gas-Turbines

TURBOJET-ENGINE
RF: Jet-Engine

TURBOPUMPS
RF: Pumps

TURBOROCKET
SA: Air-Turborocket
RF: Rocket-Engine

TURBOROCKET-ENGINE
RF: Engine

TURBOROCKET-FUEL
RF: Fuels

TURBULENCE
SA: Atmosphere
Boundary-Layer
Grid-Turbulence
Updraft

Turbulent-Air
S: Air-Turbulence
CAT
HI-CAT
Quiescent-Air

TURBULENT-FLAME
RF: Flames

TURBULENT-FLOW
RF: Flow

TURBULENT-MIXING

TWO-BODY-PROBLEM
SA: Perturbation
RF: Bodies

TWO-PHASE-FLOW
RF: Flow

TYPHON
RF: Air-to-Air
Talos

U-H-F
RF: Radio-Frequency
Ultra-High-Frequency

UDIMET-500
RF: Nickel-Base-Alloy

UDMH
RF: Dimethyl-Hydrazine
Unsymmetrical-Dimethylhydrazine

ULEXITE

Ultra-High-Frequency
S: U-H-F

ULTRA-HIGH-IMPULSE
RF: Impulse

Ultra-High-Impulse-Propellant-Systems
S: Impulse-Propel-Sys

ULTRASONIC-ENERGY
RF: Energy

ULTRA-LOW-PRESSURE
SA: Vacuum
RF: Pressure

ULTRASONIC-WELDING
RF: Welding

ULTRAVIOLET-ANAL
RF: Analysis
Ultraviolet-Analysis

VALVES
SA: Cold-Valves
Gas-Valves
Quench-Valves
Servo-Valves
Shut-off-Valve
Throttle-Valve
Venturi-Valves
Water-Quench-Valve

VAN-ALLEN-BELT
SA: Argus-Effect
RF: Radiation
Van-Allen-Radiation-Belt

Van-Allen-Radiation-Belt
S: Van-Allen-Belt

VANADIUM
RF: Refractory-Metals

VANGUARD
RF: Launch-Vehicles

VAPOR
SA: Hydrazine-Vapor
Water-Vapor

VAPOR-BINDING

VAPOR-DEPOSITION

VAPOR-DETECTION
RF: Detection
Fume-Control
Launching-Hazards
Safety-Precautions
Spectrometer

VAPOR-DETONATION
RF: Detonation

VAPOR-PHASE

VAPOR-PRESSURE
SA: FNA-Vapor-Pressure
RF: Pressure

VAPORIZATION

VAPORIZERS

VARIABLE-IMPULSE
RF: Impulse

VARIABLE-TEMP
RF: Temperature
Variable-Temperature

Variable-Temperature
S: Variable-Temp

VARIABLE-THRUST
RF: Thrust

VECTOR-CONTROL
RF: Control-Systems

VEHICLE-ANALYSIS
RF: Analysis

VEHICLE-DESIGN
RF: Design

VEHICLE-SCALING
RF: Scaling

VEHICLE-STABILITY
RF: Stability

VEHICLE-STRUCTURE
RF: Structures

VEHICLE-SUBSYSTEMS
RF: Subsystems

VEHICLES
SA: Aerospace-Vehicles
Launch-Vehicles
Manned-Vehicles
Nuclear-Vehicles
Orbital-Vehicles
Reentry-Vehicles
Test-Vehicles
Unmanned-Vehicles

VELOCITY
SA: Burning-Velocity
Exhaust-Velocity
Flow-Velocities
High-Velocity
Hypervelocity
Impact-Velocity

Rocket-Velocity
Sound-Velocity
Speed
RF: Speed

VELOCITY-LAG
SA: Particle-Lag

VELOCITY-PROFILES

VENTING

VENTING-DEVICES

VENTING-EXPERIMENT

VENTURI-VALVES
RF: Valves

VENUS-PROBES
SA: Voyager
RF: Probes

VERNIER-MOTOR
RF: Motors

VIBRATION-SPECTRA
RF: Spectra

VIBRATION-TESTS
RF: Tests

VIBRATIONS
SA: Longitudinal-Vibra
Missile-Vibration
Oscillations
RF: Oscillations

VINYL
RF: Plastics

VINYL-CHLORIDE
RF: Chlorides

VINYL-FERROCENE
RF: Ferrocene

VINYL-PLASTISOL
SA: Plastisol-Propel

VINYL-POLYMERS
RF: Polymers

VINYLATION

VIRGINIUM
RF: Alkali-Metals

VISOELASTICITY
RF: Elasticity

VISCOSITY
SA: Fuel-Viscosity
RF: Flow-Velocities

VISCOUS-VORTEX
RF: Vortex

VOLATILE-ALLOYS
RF: Alloys

VOLATILE-LIQUIDS
SA: Acid-Volatility
RF: Liquids

VOLTMETERS
RF: Instruments

VORTEX
SA: Confined-Vortex
Jet-Driven-Vortex
Primary-Vortex
Secondary-Vortex
Viscous-Vortex
Water-Vortex

VORTEX-CONTAINMENT

VORTEX-CONTROL
RF: Controls

VORTEX-FLOWS
RF: Flow

VORTEX-INJECTION
RF: Injection

VORTEX-TESTS
RF: Tests

VORTEX-TUBES
RF: Tube

VOYAGER
RF: Space-Probes
Venus-Probes

WALL-COOLING
RF: Cooling

WALL-TEMPERATURE
RF: Temperature

WARFARE
SA: Limited-Warfare

WARHEAD-WEIGHT
RF: Weight

WARHEADS
RF: Weapons

WARNING-DEVICES
RF: Safety-Precautions

WATER
SA: Heavy-Water
Subcooled-Water

WATER-CONTENT

WATER-FOG

WATER-MOLECULE
RF: Molecule

WATER-QUENCH-VALVE
RF: Valves

WATER-VAPOR
RF: Vapor

WATER-VORTEX
RF: Vortex

WAVE-GUIDES

WAVES
SA: Combustion-Waves
Deflagration-Wave
Detonation-Waves
Shock-Wave

WAX
SA: Candelilia-Wax

WEAPON-SYSTEM
SA: Airborne-Alert
Armament
Arms-Control
Missile-Systems
WS-
RF: Unconventional-Weapons

Weapon-System-Hazards
S: WS-Hazard

WEAPONS
SA: Artillery
Atomic-Weapons
Ballistics
Guns
Nuclear-Weapons
Small-Arms
Warheads
RF: Unconventional-Weapons

WEAPONS-RESEARCH
SA: Gun-Firings
RF: Research

WEAR
SA: Friction
RF: Maintenance

WEAR-EVALUATION

WEAR-PROBLEMS

WEIGHT
SA: Engine-Weights
Gross-Weight
Inert-Weight
Light-Weight
Molecular-Weight
Payload-Weight
Specific-Weight
Warhead-Weight

WEIGHT-ANALYSIS
RF: Analysis

WEIGHT-PREDICTION

WEIGHTLESSNESS
RF: Bioastronautics

WELDABILITY
SA: Alloy-Weldability

WELDED-FITTINGS
RF: Fittings

WELDED-TANK-JOINTS
RF: Joints

WELDED-TANKS
RF: Tanks

WELDING
SA: Al-Welding
Arc-Welding
Cold-Welding
Columbium-Welding
Electron-Beam-Weld
Flash-Welding
Fusion-Welding
Laser-Beam-Welding
Plasma-Arc-Welding
Resistance-Welding
TIG-Welding
Ultrasonic-Welding
Vacuum-Welding
RF: Joining

WELDING-INSPECTION
SA: Al-Welding-Inspect
RF: Inspection

WELDING-RESEARCH
RF: Research

WELDING-STANDARDS
RF: Standards

WELDING-TECHNIQUES

WELDING-TEST
RF: Tests

WFNA
SA: Acid subheadings
IRFNA
IWFNA
Nitric-Acid
RFNA
RF: Acids
Anhydrous-Nitric-Acid
Liquid-Oxidizers
White-Fuming-Nitric-Acid

WFNA-Hazard
S: Nitric-Acid-Hazard

WHEELS
SA: Inertia-Wheel

WHISKER-GROWTH

WHISKERS
SA: Alumina-Whiskers
Carbon-Fibers
Iron-Whiskers
RF: Filaments

White-Fuming-Nitric-Acid
S: WFNA

WIND
SA: Cross-Wind-Deflect

WIND-TUNNEL
SA: Blowdown-Tunnel
Shock-Tunnel

WIND-TUNNEL-MODELS
RF: Models

WINGS
SA: Delta-Wings

Wire
S: Metal-Wire

WIZARD
RF: Antimissiles

WOOD-PULPS
SA: Sulfate-Wood-Pulps

WORMHOLE-BURNING
RF: Burning

WS-107A
SA: Weapon-System
RF: Atlas

WS-133A
SA: Minuteman

WS-321A
SA: Bullpup

WS-HAZARDS
SA: Accidential-Firing
Explosion-Hazards
RF: Accident-Hazards
Launching-Hazards

WS-SR-199
RF: Penetration-Aids

X-RAY-DIFFRACTION
RF: Diffraction

X-RAYS

XENON
RF: Rare-Gas-Compounds

XSSM-N-6
S: RIGEL

YIELD-STRENGTH
RF: Strength

YOUNGS-MODULUS
RF: Elastic-Moduli
Elasticity

YTTRIUM
RF: Rare-Earth-Metals

ZEOLITES

ZERO-G
RF: Gravity
Low-G
Zero-Gravity

ZERO-G-CONTROL
RF: Control-Systems
Gravity-Control

Zero-Gravity
S: Zero-G

ZINC
RF: Metals

ZINC-CHLORIDE
RF: Chlorides

ZINC-COATINGS
RF: Coatings

ZINC-OXIDE

ZIRCONIA
RF: Refractories

ZIRCONIUM
RF: Refractory-Metals

ZIRCONIUM-BORIDE
RF: Borides

ZIRCONIUM-CARBIDE
RF: Carbides

ZONING-TECHNIQUES

ZUNI
RF: Missile

ZUNI-GRAINS
RF: Grains

Section IV

SUPPRESSED WORD LIST

ABLE
ABOUT
ABOVE
ACCEPT
ACCEPTANCE
ACCOMPANY
ACCOMPANYING
ACCORD
ACCORDING
ACHIEVED
ACROSS
ACTION
ACTIONS
ACTIVITY
ACTIVITIES
ACTUAL
AD-HOC
ADDENDUM
ADDITIONAL
ADEQUACY
ADEQUATE
ADJUNCT
ADVANCE
ADVANCED
AFFECT
AFFECTED
AFFECTING
AFFORDING
AFTER
AFTERWARD
AGAIN
AGAINST
AGO
AID
AIMED
ALL
ALLOWS
ALLOWED
ALLOWING
ALMOST
ALONE
ALONG
ALREADY
ALSO
ALTHOUGH
ALWAYS
AMONG
AND
ANNIVERSARY
ANNUAL
ANOTHER
ANY
ANYTHING
APART
APPARATUS
APPARENTLY
APPEAR
APPEARING
APPENDIX
APPLICABILITY
APPLICABLE
APPLICATION
APPLICATIONS
APPLIED
APPLY
APPLYING
APPROACH
APPROACHING
APPROXIMATE
APR
APRIL
ARBITRARY
ARBITRARILY
ARE
AREA
ARISING
AROUND
ASK
ASKED
ASKING
ASKS
ASPECT
ASPECTS
ASSESSMENT
ASSOCIATED
ASSOCIATING
ASSUMING
ATTEMPT
AUG
AUGUST
AVAILABLE
AWAY
BASED
BASIC
BASIS
BECAME
BECAUSE
BECOME
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A modified Keyword Out of Context (KWOC) system was developed to gain rapid control over more than 8,000 scattered, unindexed documents. This was the first step in providing the technical information support required by Air Force Rocket Propulsion Laboratory scientists and engineers. Implementation of the KWOC system, computer routines, and progress made during the course of the contract are described. Results are evaluated and recommendations for a total technical information program are presented. Complete, detailed procedures for operating the system are provided in the appendix. This includes an extensive, cross-referenced thesaurus.

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